the American Perfumer and ESSENTIAL OIL REVIEW

COSMETICS · SOAPS · FLAVORS

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Editorial Comment

Don't Play with Fire!

Firefighting in its simplest form consists of workmen with extinguishers, and progresses from that in complexity to a chain of sequences where safety provides for defense in depth, starting with workmen with extinguishers, and progressing through a departmental fire brigade, plant fire brigade, to the municipal fire department. Of course, this last applies only to very large plants, and need not be given much consideration here. The important thing, though, is to have a plan, and to immediately call in the second line of defense. In most cases this means that while workmen are fighting the blaze, turn in a fire alarm, then let the city firemen finish the job.

The plan calls for knowing what to do when fire occurs. This should be under the supervision of either a trained fireman, in the case of larger plants, or a company official. In the latter case he may obtain training from the city fire department. He may also obtain valuable information by writing for "The Training Manual for Industrial Fire Brigades," published by the National Fire Protection Association, 60 Batterymarch St., Boston 10, Mass. He is responsible for organizing, training, equipping and directing employee fire fighters.

Conditions vary with the size of plant, method of manufacture, and materials processed, but a program should be followed which may vary from simply giving an occasional talk on fire extinguishers—a talk by a local fireman would seem to be appropriate—to elaborate fire drills held at frequent intervals.

In plants with sufficient manpower it is advisable to form a fire brigade. Members should receive special training in the use of fire hose, wheeled extinguishers, ladder practice, salvage procedure, sprinkler operation and control, and other specialized fire-fighting practices.

It's hard to get stuff these days. Hold on to what you have until it is disposed of through natural channels. Don't let fire do it for you in a hurry.

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• I have resigned as president and treasurer of Standard Synthetics, Inc., with whom I have been identified since its establishment in this country, in order to head my own company.

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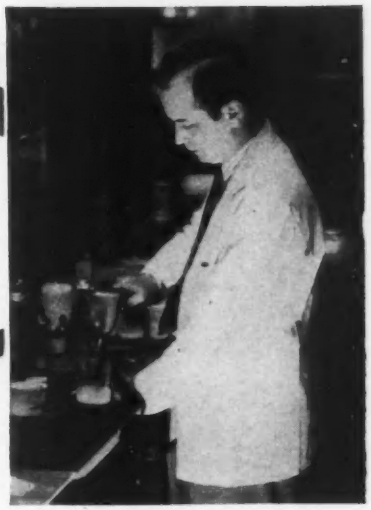
Desiderata

by MAISON G. DeNAVARRE



M. G. DeNavarre at work in his laboratory

SCARCITIES of some prime materials suggest the exploitation of more readily available flavor ingredients, possibly mixed with the more scarce things.

Orange juice is swell with raspberries, cherries or chocolate. Chocolate mocha combinations with coffee stretch the chocolate. Pineapple goes with chocolate and vice-versa. Apple goes with pineapple, as do bananas. Coffee makes vanilla taste like burnt almond. Tea goes well with spices and the other way around too. Clove makes orange taste like nutmeg and stretches the nutmeg. Peanut butter and vanilla stretch chocolate; they also go nicely with banana. Cloves and ginger pep up grape juice. These are some of the things well known to a good cook. Flavor makers are already using some of the ideas, but could use more of them. Thus the use of grapefruit juice in place of orange or lemon juice in cola flavors, aids in the reduction of some caffeine and phosphoric acid.

AIR CARGO A BOON TO THE TRADE

Not to be caught napping, a couple of the airlines have been out soliciting business, freighting by air, from East to West in particular . . . at the moment, but either way and further, for later.

Recently I sat in at a conference on air cargo as it applies to the drug industry. The revelations made, while apparent to any thinking and reading person, were nevertheless surprising. Imagine, your freight delivered anywhere in the U. S. overnight! Anywhere in the world in a few days! At rates that will probably be lower than or equal to ordinary *freight*. Even now, air freight is cheaper than air express, and does as quick a job. With the embargo on freight existing in certain large cities air freight takes on immediate significance. Consult your airlines.

SULFUR IN THERAPEUTIC COSMETICS

Lowly sulfur, common ingredient of the skin, hair and nails has been used off and on as a cosmetic ingredient, but it never got to first base. IT WILL. And not long from now. Once we learn how to handle it or after we find a suitable compound to carry it. Cystine of hair, skin and nails is an essential amino acid. It contains quite a chunk of sulfur in it. But cystine is expensive. Not only that, but we don't know for sure what happens to the skin, for several generations, as a result of sulfur applications. Nor do we know for sure that one form is more suitable than another. We do know that sulfur as it exists in ichthyol is apparently beneficial not only to skin but to the body as a whole. But it is black as tar, therefore, hard to handle. Colloidal sulfur as far as we know seems to be one of the best forms for cosmetic use because of its smallness of particle size, allowing the sulfur to react with skin secretions forming therapeutically active compounds. But sulfur also has a capacity to be allergenic . . . or maybe it is just a pretty good skin stimulant. Anyway, keep your eye on it. Sulfur in some form is going to be an ingredient of the ever growing list of therapeutic cosmetics. Some practically colorless and odorless compound with either oil or fat solubility is the thing needed. When conjugated with other compounds, the sulfur tends to prolong the action as in thiobarbiturates or *thio-estrogens*. The thio compound is not objectionable in either color or odor here. The same holds for thiocholesterol.

ANTIPERSPIRANT WOES

It is recalled that ammonium alum was once used as an active ingredient in an antiperspirant cream. The reasoning was thus: it was a mild astringent, cheap, and it was less irritating to use on the skin. That was before the day of buffers to prevent clothes from rotting, although ammonium alum was believed to be less harmful according to washing and ironing test.

BUT, Oh boy the grief! Did you ever make a 4 or 5 per cent solution of alum in water? Do it once. Watch and see what happens. Add anything to lower the water solubility of the alum a little, like alcohol. Beautiful crystals aren't they? Now add a supposed alum solubilizer. Still nice crystals. But the devil of it is, everytime you think you have overcome a fault, another pops up. I know of a case where all the woes were overcome. The antiperspirant cream made in the laboratory and in manufacturing practice tested out well . . . in laboratory tests. I'd hate to have to pay a penny for each jar of the stuff that came back—a solid mass of crystals. Later it was found that alum was *fundamentally* wrong. Today, the formulator and manufacturer are much wiser. If you can form alums by double decomposition, heaven help you if you have such a combination in an antiperspirant. This is not limited to alum. If by double decomposition you form a less

Infantry Sergeant bites his tongue as he heaves a grenade at Jap pillbox

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soluble substance, you are in the same trouble.

EXCESS PROFITS GO TO UNCLE SAM

In some shape or form, excess profits go to Uncle Sam. Uncle Sam is the people. So, anything that helps the people, helps Uncle Sam.

I can think of scores of beautiful research projects that would burn a hole in your excess profits. There was (maybe still is if the guy could eat his lavender plants) a lavender project in the Pacific Northwest. The thing dribbled along for ten years. Finally about two or three years ago, a yield of about 150 pounds of oil was obtained. No one would finance the fella as should have been done. It was cheaper to import from Europe after the war, it was said. Vetivert might have been a reality. About $10,000 in cash, and a little more for a few years would have paid dividends in Louisiana.

RESEARCH PAYS DIVIDENDS

Earlier in this feature was mentioned the need for work on the action of sulfur on skin. The same applies to the effect of estrogens on skin. Also the hygienic value of including a powerful but safe antiseptic in skin applications. What about a study of the science of hair waving? Little is known about that.

These are not day dreams. They could be profitable post-war realities. Take the case of musk from muskrats. The idea is not new. But not until someone put his head and money to it, did it become a valuable reality. Now, it helps to replace real musk, besides supplying a source of income to the rat trappers who in turn rid the land of a pest.

The trouble with so many people is that they feel that no further research is required to propagate their product. And yet, few of the products made today are exactly the same as they were 20 years ago. Another fault, is that the investor in pure research expects practical results . . . but quickly. Take a look at the chemical industry. Check over the years of pure research before nylon was produced. Then came a few years of practical research before it was a commercial reality. The company sponsoring the project waited it out . . . profitably . . . just as they have waited out other projects . . . profitably. You see, the money you invest now, will take a few years or longer, before it pays dividends.

QUESTIONS AND ANSWERS

534. LANOLIN IN FACE CREAMS

Q: *Can you give us any data on what percentage of lanolin may be used in face creams without causing dermatitis?*

S. C. I.—NEW YORK

A: There is no minimum or maximum percentage of lanolin to use in any type of cream. If the lanolin is of high quality it should not be irritating even if used straight. If you use the proper perfume, your cream will not be irritating. When we say no irritation, we mean no *common* irritation, but obviously this does not cover idiosyncracies or hypersensitivity. All products sensitize some people, but if your materials are of the highest quality and properly selected, you should have no trouble. We have seen creams containing much more than 15 per cent lanolin being used regularly with no untoward irritation.

535. SOIDIFIED PERFUME

Q: *After much of our own experimenting, we are asking you for suggestions in formulating a suitable carrier or base for solidified or solid perfume.*

J. S.—ILLINOIS

A: Solid perfume can be made in many ways depending upon what you want. Short fiber petrolatum has been used as a base for many such products. The use of amorphous waxes and mineral oil with petrolatum make it less sticky. To overcome the greasiness, inert pigment, such as zinc or magnesium stearate, silicic acid, calcium silicate or talc may be incorporated. The supplier of a particular base is sent to you under separate cover. Using 75 parts of this base with 25 parts of pigment should give you a nice carrier for your perfume.

536. LIQUID ROLLING LOTION

Q. *We are wondering if you can supply us with a formula for a good liquid rolling lotion that will be trouble-free, that is, produce copious rolls and not thicken in the bottle on standing. We have been doing a small business on such a product, the formula for which is appended. We find that propylene glycol aids in keeping this product thin, but it impairs the rolling.*

G. F. A.—CALIFORNIA

A: One of the characteristics of this type of product is a jelling of the bottle. One of your ingredients undoubtedly contributes to this jelling in a substantial way. The name of this ingredient goes to you under separate cover. You may also be having some fermentation, since this too will cause jelling, and we suggest that you check older bottles of this lotion by carefully loosening the cap. If you get a popping or a sizzling sound, it indicates pressure inside the bottle and that fermentation is taking place. From the amount of preservative present in your formula, it is quite probable that this might be one of the troubles you are encountering.

537. SODIUM PECTATE

Q: *Please tell us more about making pectate from Sisal Flesh as recently mentioned in* THE AMERICAN PERFUMER.

G. A. L.—NEW YORK

A: The item you refer to appeared in abstract form in THE AMERICAN PERFUMER, but was of British origin. To our knowledge, no special project exists in the United States. However, a substantial amount of work has been done on various pectates by the California Fruit Growers Association and by the General Foods Company, whose address is sent to you by separate mail. The first mentioned company actually produces and is selling sodium, ammonium pectate, the compound in which you are interested.

Methods of Analyzing Cold Wave Solutions

The active ingredient of most heatless permanent waving solutions is thioglycolic acid . . . Certain home wave kits use sodium sulfite

by DAN DAHLE and S. H. NEWBURGER

Cosmetic Division, U. S. Food and Drug Administration, Washington, D. C.

A MAJORITY of the solutions, today marketed for heatless permanent waving, contain as the active ingredient thioglycolic acid, combined with sodium, ammonia or monoethanolamine. In place of thioglycolic acid thioglycerine has also been used and 2-thioethanol has been proposed. In addition certain so-called "home wave kits" use sodium sulfite as their active agent.

Various cold waving solutions have been analyzed more or less completely in our laboratories. From these analyses one has been picked at random to be discussed in connection with our analytical methods. This product contained two solutions, one for waving, the other for neutralization, with directions calling for mixing the neutralizer with hydrogen peroxide prior to application.

THE WAVING SOLUTION

Prior to the quantitative analysis of a solution of this type certain qualitative tests should be made. These tests as well as methods to be used are listed below:

QUALITATIVE TESTS

Sulfates: Use 5 ml of sample solution, dilute to 100 ml with water, and precipitate $BaSO_4$ from boiling, acidified (HCl) solution with 5 ml of a 10 per cent $BaCl_2$.

Sulfides: Acidify 5 ml of sample solution with dilute H_2SO_4, heat in a test tube, note odor, and allow any escaping gas to pass a piece of filter paper impregnated with lead acetate. (See also quantitative determination below.)

Sulfites may often be detected by an odor of SO_2 in an acidified solution. In the absence of thioglycerine and thioethanol, test for *sulfites* and *thiosulfates* by the following method.[1]

Dilute 5 ml of sample to 100 ml with water. Acidify a 10 ml aliquot with 10 per cent acetic acid, adding 1 ml in excess. Transfer to a 100 ml volumetric flask, add 10 ml of glycerine and 2 ml of 10 per cent cadmium acetate solution. Make to volume with water, mix and let stand for 30 minutes. Filter, add starch solution to an aliquot of the filtrate and titrate with 0.1 *N* iodine. No titer shows absence of sulfites, thiosulfates, thioglycerine and thioethanol.

This method is useful for the separation of thioglycolic acid and sulfides from thioglycerine, thioglycol, sulfites, sulfates, and thiosulfates. Sulfides and thioglycolic acid may later be separated as indicated under thioglycolic acid below. (Cadmium sulfide is not soluble in ammonia.)

Sulfites and thiosulfates may be distinguished from one another by the fact that sulfites do not reduce iodine in weak acetic acid solutions containing formaldehyde, whereas thiosulfates under similar conditions are not affected by the formaldehyde.

Ammonia: Note odor, and test with a moistened strip of red litmus paper, suspended above the sample.

Sodium: Show its presence with the flame test.

Thioglycolic acid: Acidify a portion of the solution to be tested with 10 per cent acetic acid and add an excess of about 1 ml to each 10 ml of solution. Add 2 ml of 10 per cent cadmium acetate and shake. A white gelatinous precipitate forms if thioglycolic acid is present. Now add an excess of 10 per cent ammonium hydroxide and shake. The precipitate of cadmium thioglycolate will dissolve.

Other tests have been described by Hoshall.[2] They involve color reactions with ammonium molybdate, copper sulfate and ferric chloride. Jones[3] identifies the acid by oxidation to dithiodiglycolic acid and determines its melting point (106-107° C), and equivalent weight (91.2).

Thioglycerine and thioethanol:[4] To about 1 ml of a 2-5 per cent solution of the thio compound add 2 ml of 10 per cent lead acetate (U.S.P. test solu-

Table I—Lead Acetate Reactions

	Neutral	With Triethanolamine	With Acetic Acid
Thioglycerine	Yellow soln	Yellow ppt	Colorless soln
2-Thioethanol	White ppt	Yellow ppt	White ppt
Thioglycolic Acid	Yellow ppt	Yellow ppt	Yellow ppt

tion). Divide into three parts. To one add an equal volume of 10 per cent acetic acid, to the second a drop of triethanolamine. Leave the third as is. Table I shows the reactions.

QUANTITATIVE PROCEDURES

Specific gravity: Frequently a sufficiently accurate determination may be made by simply weighing a 10 ml portion of the sample solution. For greater accuracy use hydrometer, Westphal balance or pycnometer.

pH: Determine with a glass electrode instrument.

Non volatile matter: Place 5 ml of sample in a weighed dish, evaporate on a steam bath for 2 hours, put the dish into a vacuum desiccator, leave it for 24 hours under vacuum, and re-weigh.

Note: Our experience has been that a small continued loss of weight is noticeable after 48 and 72 hours under vacuum. This determination therefore seems to give slightly high results.

Water by toluene distillation: Use the apparatus and procedure described in Methods of Analysis A. O. A. C. 5 ed., page 353.

Sulfated ash: Place 5 ml of sample in a weighed porcelain crucible and evaporate to dryness. Char at about 400° C, cool, add 2 ml of concentrated H_2SO_4, evaporate to dryness on sand bath or hot plate (or *carefully* over open flame) and heat to 700-750° C for 1 hour. Cool, moisten with H_2SO_4 and again heat to 700-750° C for 1 hour. Cool and weigh.

Note: The sulfated ash is preferable to the regular ash in cases where sodium or other alkali salts are present because it gets rid of all other common acids (except phosphoric) and leaves the metals as sulfates instead of as a mixture of various salts and oxides.

Total nitrogen: The regular Kjeldahl procedure may be applied to a 5 ml portion of the sample.

A microdetermination by the Kjeldahl method is described in *J. Assoc. Official Agr. Chem.* **16**, *255 (1933).* This method is scheduled to appear in the next issue of the A. O. A. C. Book of Methods and can be satisfactorily applied to 2 ml of a solution prepared by diluting 5 ml of sample to 100 ml with water.

Ammonia: Determine on 5 ml aliquots of sample by direct distillation, and by distillation after addition of fixed alkali. The microdetermination mentioned under "total nitrogen" may also be used.

Reducing substances "as is": In most cases this determination measures the active thioglycolic acid present in the solution. Determine as follows:

Dilute a 5 ml sample to 100 ml with water (of total nitrogen). Pipette a 20 ml aliquot into a suitable titration flask and dilute to 50 ml with water. Add methyl red indicator and titrate with 0.1 *N* HCl to a red end point. Then add starch indicator and titrate with 0.1 *N* iodine.

Courtesy, Sales Affiliates, Inc.

Shampoo hair thoroughly before a cold permanent wave

Sulfites and sulfides also reduce iodine. If they are present, determine the sum of the reducing substances as follows:

Based on the preliminary estimations place in a titration flask a measured portion of 0.1 *N* iodine and dilute HCl, sufficient to provide a slight excess over that to be consumed by the sample. Pipette the sample into the acidified iodine solution, keeping the tip of the pipette under the surface of the liquid. Mix the contents thoroughly, add starch indicator and titrate the excess iodine with 0.1 *N* thiosulfate.

1 ml of 0.1 *N* iodine = 0.009209 gram of thioglycolic acid.

Sulfites may be estimated in the presence of thioglycolic acid by the procedure described under sulfites qualitative (above) but the method gives results that are 1 to 5 per cent too low, probably due to loss of sulfite by volatilization.

1 ml of 0.1 *N* iodine = 0.0032 gram of SO_2.

Thioglycerine may also be determined by titration with iodine. It cannot, however, like thioglycolic acid, be separated from sulfites by means of cadmium acetate.

1 ml of 0.1 *N* iodine = 0.01081 gram of thioglycerine.

Reducing substances after reduction: This determination allows a calculation of the amount of thioglycolic acid, changed by oxidation to dithiodiglycolic acid. The method below is a variation of one contributed by the Scientific Section of the Toilet Goods Association.[5]

Dilute a 5 ml sample to 100 ml, pipette a 20 ml aliquot into a 400 ml beaker, and add 200 ml of 10 per cent H_2SO_4. Prepare a Jones' reductor as described in Blair, "The Chemical Analysis of Iron," 8 ed., pp. 88-89 or Treadwell and Hall, "Analytical Chemistry," 7 ed., page 539, vol. 2. Wash out the reductor with 20 ml of water and 200 ml of 10 per cent H_2SO_4 leaving sufficient solution in the reductor to cover the upper level of the zinc. (These washings should not titrate more than 0.1 to 0.2 ml of 0.1 *N* iodine.)

Place a clean one liter suction flask under the reductor and proceed as follows:

(a) Run 50 ml of (1 + 19) H_2SO_4 (1 ml of H_2SO_4 added to 19 ml of water) through the receiver at such a uniform rate as to require 5-10 minutes for passage.

(b) Follow this with the sample aliquot in the 400 ml beaker at a uniform rate and requiring 5-10 minutes for passage.

(c) Wash out with 100 ml of (1 + 19) H_2SO_4.

(d) Finally wash with two or three 100 ml portions of water.

Note: During the process care must be taken to see that the reductor is always filled with solution (or water)

reaching the upper level of the zinc.

(e) Release the suction and wash the emergent tube. Titrate the contents of the flask with 0.1 *N* iodine, using starch indicator.

This titration measures total reducing substances. The difference between this titration and the previous one for "reducing substances as is" measures the dithiodiglycolic acid formed by oxidation of the thioglycolic acid (an indication of the deterioration of the solution).

Total sulfur: Several good methods are available, e.g. Jones' semimicro procedure[6] or the following rapid method proposed by Shupe:[7]

In a 400 ml beaker place a measured portion of sample, containing not over 0.5 gram of organic material and from 10 to 50 mg of sulfur. Dilute with water to about 25 ml and add 2.5 grams of solid NaOH. Allow to dissolve and add 3 grams of $KMnO_4$. Cover with a watch glass and heat to a gentle boil for about two minutes. (Sufficient excess $KMnO_4$ should be present to maintain a purple color.) Cool and add carefully 20 ml of conc. HCl. Boil for about five minutes to expel chlorine and to dissolve most of the manganese oxides.

Add 2 or 3 drops of 30 per cent H_2O_2 to dissolve remaining particles of MnO_2. Dilute to about 300 ml with water. Heat to boiling and add slowly 10 ml of 10 per cent $BaCl_2$ solution. Digest for about 1 hour on a steam bath and let stand at room temperature for another hour. Collect the precipitate in a tared Gooch crucible, wash with water, dry at 100° C and weigh the $BaSO_4$. Make an appropriate correction for a blank on the reagents.

Weight of $BaSO_4$ x 0.1373 = sulfur
Weight of $BaSO_4$ x 0.3945 = thioglycolic acid

Hydrogen sulfide:[8]

(a) Prepare an absorbing solution by dissolving 5.5 grams of $CdCl_2 \cdot 2H_2O$ (or 7 grams of $CdSO_4$) in 50 ml of water. Add 120 ml of ammonia, mix and dilute to 250 ml with water.

(b) Prepare a suitable generating flask with an outlet tube leading into a container holding 50 ml of the absorbing solution and an inlet tube reaching to the bottom of the flask, and connected to a supply of nitrogen gas.

(c) Place 2 ml of sample in the generator flask and add 100 ml of (1 + 4) H_2SO_4. Bubble nitrogen through the solution for 30 minutes and allow the escaping gases to pass through the absorbing solution.

(d) Pour the contents of the absorber into a 600 ml beaker containing about 400 ml of distilled water. Wash out the absorber first with water, then with dilute HCl and add the washings to the beaker. Neutralize with HCl, add starch solution and titrate immediately with 0.1 *N* iodine. Add more HCl from time to time to insure complete decomposition of the sulfide. At the completion of the titration make sure that the solution is strongly acid and allow 5 minutes for a permanent end point.

Note 1: For check analyses it is advisable to add excess iodine and sufficient HCl to the beaker before adding the contents of the absorber and to titrate back the excess of iodine with 0.1 *N* thiosulfate.

1 ml of 0.1 *N* iodine = 0.001703 gram of H_2S.

Note 2: If nitrogen gas is not available air current may be used where small quantities of H_2S are present (as in these solutions). No significant error will occur.

The sample analyzed by us was found to contain a large quantity of sodium chloride (which incidentally is not common in this type of product). The following method was used for the chlorine determination:

In a porcelain crucible mix 2 ml of sample with 3-4 grams of K_2CO_3. Cover evenly with 1 gram of the carbonate, dry and heat at 450-525° C until all organic matter is destroyed. Proceed as directed for "Sodium Chloride" in paragraph 23 of the A. O. A. C. Methods of Analysis, 5 ed., page 254. This procedure involves an oxidation with $KMnO_4$ of sulfides (formed by reduction during incineration), reduction with SO_2, precipitation and the weighing of AgCl.

AgCl x 0.40784 = NaCl

For the identification and determination of amino compounds Shupe[9] has proposed certain methods.

Primary amines give a purple color with a solution made up from 1 gram of sodium nitroprusside, 20 ml of acetone and 80 ml of water.

Secondary amines give a blue color with a similar sodium nitroprusside agent in which 10 ml of acetaldehyde is substituted for the 20 ml of acetone.

For identification and determination he proposes the preparation of the para-brombenzene-sulfonyl derivatives of the amines.

Jones[10] also has contributed methods for the volumetric determination of alkanolamines. Briefly the procedure involves extraction of the amine with HCl or HBr, removal of excess acid by evaporation, liberation of the amine with silver oxide, separation from the silver halide, and titration with acid.

RESULTS

The following results were obtained on the sample analyzed.

Qualitative:

Sulfates, sulfites, thiosulfates and thioglycerine: *Negative*
Sulfides: *Trace*
Ammonia, sodium, and thioglycolic acid: *Positive*

Quantitative:

(1)	Specific gravity	1.110
(2)	pH	9.4
(3)	Water by toluene distillation	79.3%
(4)	Non-volatile matter	21.6%
(5)	Sulfated ash	16.1%
(6)	Chlorides as NaCl	8.0%
(7)	Total nitrogen as N	0.92%
(8)	Total ammonia as NH_3	1.01%
(9)	Thioglycolic acid before reduction	5.23%
(10)	Thioglycolic acid after reduction	6.52%
(11)	Total sulfur	2.77%
(12)	Hydrogen sulfide, less than	0.01%

DISCUSSION OF RESULTS

The water (3) plus non-volatile matter (4) totals 100.9 per cent. Since there is also present about 1 per cent of ammonia the vacuum drying apparently failed to eliminate about 2 per cent of volatile matter.

The difference between the thioglycolic acid estimated from (10) and from (9), is taken as a measure of the deterioration, i.e., calculated to dithiodiglycolic acid.

The total sulfur (11), less the sulfur combined as thioglycolic and dithiodiglycolic acids, shows the presence of other sulfur compounds. Since qualitative tests showed absence of sulfates, sulfites, thiosulfates, and thioglycerine, and (12) showed the quantity of sulfides to be negligible, these sulfur compounds are in all probability a measure of impurities in the thioglycolic acid. The common

manufacturing process for this acid also results in formation of compounds such as thiodiglycolic acid, $(HOOC\text{-}CH_2)_2S$. A calculation of residual sulfur to this acid may therefore be justified.

The sulfated ash (5) indicates that the acids are combined primarily as sodium salts. Tentatively, therefore, we have:

Sodium thioglycolate, from (9)	6.6%
Sodium dithiodiglycolate, from (10) and (9)	1.6%
Sodium thiodiglycolate, from residual sulfur	3.0%
Sodium chloride from (6)	8.0%

The sum of these is 19.2 per cent which compares reasonably well with the 21.6 per cent of non-volatile matter particularly if, as indicated by the sum of (3), (4), and (8), the figure 21.6 per cent is about 2 per cent too high.

The sodium required for the formation of the salts checks with the sulfated ash (5) as follows:

Sodium, calculated	5.48%
found	5.21%

This would indicate that at least 0.2 per cent of the ammonia (8) is combined rather than free, which is not unreasonable if we consider that an unbuffered solution of 1 per cent of ammonia would show a pH of 11.5 whereas this solution showed 9.4.

The difference between the total nitrogen (7) and the nitrogen combined as ammonia (8) is 0.086 per cent. This may be an analytical error, indicating the presence of a surface active agent such as an alkanolamine, or the presence of urea. A qualitative test for primary amine was positive but the available sample quantity was insufficient for a quantitative determination.

All in all the probable formula shapes up as follows:

Sodium thioglycolate	6.6%
Sodium dithiodiglycolate	1.6%
Sodium thiodiglycolate	3.0%
Sodium chloride	8.0%
Ammonia	1.0%
Water	79.3%
Undetermined	0.5%
Total	100.0%

It may be of speculative interest to note that if the 0.086 per cent of non-ammonia nitrogen were present as monoethanolamine it would correspond to 0.37 per cent, i.e., the sum total of the components found by analysis would be 99.9 per cent instead of 99.5 per cent.

THE NEUTRALIZING SOLUTION

The following was found, qualitatively and quantitatively on this solution.

pH	2.3
Non-volatile matter	faint trace
Acetic acid	7.9%
Color	faint trace

The *pH* was determined as described for the waving solution.

For *non-volatile matter* 5 ml of sample was pipetted into a weighed dish, and evaporated to dryness on a steam bath. The dish was cooled in a desiccator and re-weighed.

Acetic acid was detected by odor and its presence confirmed by preparation of the p-nitro-benzylacetate. (For directions see Shriner and Fuson, "Identification of Organic Compounds," 2nd ed., page 132. The melting point of the derivative is 78° C.)

For the quantitative determination a 2 ml sample aliquot was diluted to 50 ml with water and titrated with 0.1 *N* NaOH using phenolphthalein as indicator.

1 ml of 0.1 *N* NaOH = 0.006 gram of acetic acid.

As an additional confirmation it may be of interest to note that the theoretical pH for an unbuffered water solution containing 7.9 per cent acetic acid should be 2.305 which compares favorably with the 2.3 found by analysis.

The presence of *color* was indicated by the shade of the original solution and the non-volatile residue. The quantity present was too minute to weigh. Wool dyeing tests indicated that a coal-tar color was present; spot tests on the dyed wool and a spectrophotometric comparison showed the color to be FD&C Yellow No. 5 (tartrazine).

Probable formula:

Acetic acid	8%
Water	92%
Color	Trace
Total	100%

SUMMARY

A fairly complete analysis of a cold waving preparation has been presented as well as the methods used in making this analysis.

Since the product was picked at random from those at present on the market the composition is not necessarily typical of all solutions of this type. The proposed methods, however, should be applicable to the analysis of other similar products.

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Olive Industry in Peru

The production of olives in Peru has gradually decreased, although conditions, soil, temperature and moisture are favorable to their cultivation. In 1941 the number of trees was about 87,600, and production amounted to 2,285 tons of olives and 35 metric tons of olive oil. The average annual production during recent years has been 500 metric tons of olives and 50,000 pounds of oil. Even when production is above average imports from abroad are resorted to supplement the supply.

Olives produced in Peru have a different taste from those grown elsewhere. Those who have acquired a taste for them are satisfied with the flavor, but exporters say they cannot compete with olives grown elsewhere.

No olives have been exported since 1939. Previous to that time small amounts came to the United States and Bolivia. No olive oil has been exported during this time.

Olive oil was imported from Italy before the war. A small volume came from Spain and Portugal as well. Upon the outbreak of the war these shipments ceased, so Argentina is now the principal source of supply. As long as cotton can be more profitable to cultivate it is felt that Peru will relegate the cultivation of olives to secondary importance.

Tax Law Helps You Prepare for Post-war Period

Tax planning can play an important role in post-war program . . . A check list of such planning deductions that can be taken from current taxes is discussed

by J. K. LASSER, C.P.A.

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COMPETENT analysts tell us that we can have a decent level of post-war employment only if there is an increased output of goods and services after the war, requiring a production level 60 per cent to 70 per cent greater than in 1939, *when we had some 15 million unemployed.* obviously, a vast extension of peacetime production is necessary.

But the problem is not basically production. It is an expansion of the *desire* of people to *buy*. That means people must be sure of their jobs and a continuous flow of income. Getting production is simple. But getting people to buy 60 per cent more than they did in 1939, so that production can be continually maintained, is a staggering assignment for American ingenuity.

It is to be seriously questioned whether any traditional approach is sufficient to attain this objective. Old-time mechanical methods will not enable us to organize—

- Confidence in our buyers to spend 60 per cent more than they did in 1939
- An expanded civilian production equal to our war production so that civilians will have the materials available to be bought
- A distribution system that will make the materials available
- Investment expenditures of a magnitude *never before realized in peace* in order to make all this possible.

POST-WAR POTENTIALS

Full employment, acceleration in jobs and manufacturing processes, widening markets, new and better merchandise for the nation's retailers to sell—all these are admittedly potentials of post-war. But they will not automatically happen. *Business must risk its funds to win these goals now* and after the war.

Tax planning can be an important part of such post-war planning.

The check list that follows presents some of the things you should be thinking about today—before complete conversion to peacetime production begins.

It is given with this caution: much of it urges *deductible* expenditures today. But there can be too much present planning. It might create indifference to mounting expenses that cannot be curtailed when wartime momentum is ended and competition again becomes severe. It might also cause unwise expansion into new fields and among new customers without appraisal of their ability to meet obligations upon a sudden termination of hostilities.

Yet it is enormously important to spend now to insure future income. That is not to suggest spending because it is cheap. Spending must be undertaken if free enterprise is to exist.

Another preliminary word—our tax system is often criticized as failing to reflect a true picture of what is actually occurring. For example, much criticism is levelled because of the failure to admit deductions for reserves needed at the war's end. Reference to such a check list will suggest that the tax law *actually encourages* the intelligent effort to insure post-war security for business and its people. But if you seek that end, you must get it by the methods outlined in the law.

MANY PEACETIME PROBLEMS

Our job is to turn our productive capacity from instruments of war to goods and services needed by a population at peace. But they must buy them, and they must spend 60 per cent more than they were induced to spend in the pre-war era if we are to maintain war levels of wage payments. Recognizing that, we face *not a production job* but a challenge to our confidence in our way of life and our marketing enterprise. The dislocation of war must be overcome by ingenuity in developing new products, improving old ones and then finding out how to sell them. The problem is not so much production as it is *finance, promotion, distribution and marketing.*

What deductions can you make from taxable income when disbursing money today that will help you get ready for the post-war period? The most important problem is to find your post-war products, your post-war methods of production, your post-war markets and the methods of marketing. That includes new designs and models to meet current tastes and full use of the newer materials and processes developed by the momentum of war. It includes using the keys to lower post-war production costs by training employees to do more and better work; using effective production planning and control; installing suitable handling methods and equipment; taking advantage of work simplification methods; adopting equipment layout that suits the job; providing adequate electrical and mechanical services, and looking after employees' health and welfare. It also covers studies of—simplified distribution methods, products adapted to additional markets, the place of exports in the picture, the result of current population shifts upon the whole marketing operation and many other things.

Accelerated research has produced new products that have made obsolete

peacetime consumer purchases and has created new methods of distribution, branding and styling. They are said to eliminate many pre-war practices. They will require unusual costs if you simply wait for the conversion period. Moreover, in many cases we must create new business where wartime research has practically eliminated a prior field.

To find profits for the post-war is a full-time job for skilled technicians having plenty of resources to do an intelligent job. All of that involves money, experimentation and sweat. How can you do all these and *get ready?*

PROVISIONS OF THE LAW

Here is what the Treasury says you may do. You can *deduct any costs* directed to patronage that *might reasonably be expected* in the future. That simple statement is an approval of any expenses honestly directed to protect your company, its assets and its people. It applies even if you are a new company.

In all costs, the Treasury statements fully recognize your need to maintain, even through advertising, public goodwill toward your trade names and products looking toward eventual return to peacetime production. Your other costs may cover even the problem of introducing new products and added lines, the method of changing your selling practices to permit you to compete for new markets and new sectors of population. In all of that, you must only be ready to show that your disbursement is one of seeking sales that are reasonable for the plant and products you will have when you can start peacetime production.

The tax law also gives you *full deduction* for costs of studies and plans to get you *ready* for the post-war. The following check list summarizes what a host of authorities on management, sales and production think is the most important study that you should undertake *now* if you expect profitable operations in the post-war period. They naturally differ on the most important steps. This is the composite.

You need to spend all your energy that is not devoted to war production in every direction in which you are not ready. The tax law recognizes that these are ordinary and necessary expenditures *today* if they are actually directed to *patronage that might be expected* in the future.

You can deduct product studies from today's income if they are designed—To build a list of possible products, and then to narrow it down to the ones which offer best possibilities. That means research into manufacturing feasibility, general market conditions, production costs in relation to selling price and probable market acceptance. The process of getting a finally developed product which you can produce economically and sell advantageously is a long job.

To survey old products from the standpoint of production cost, price, packaging and buyer acceptance. This takes the same market studies into methods of distributing. Both require that present or former customers be contacted, especially in the field of raw, basic and semi-finished goods, to learn their post-war requirements.

To get your market analysts to look for expanded uses for present products, through development of new users, faster replacement and multiple use by your customers (use of more units at one time by one customer), new uses and new applications.

To find what wholly new products will be sufficiently better or sufficiently cheaper to create additional buying and enlarge consumption. These offer the best means of expansion. This calls for close coordination between engineering and market research. Sources of ideas are your own engineers, research or other company men, the Patent Office, the Alien Property Custodian, your plant managers, advertising aimed at getting patented or patentable items, outside engineering, market research and industrial design firms and your own salesmen.

To find what methods you can develop to teach consumers new uses of existing products or how you can secure markets never before believed attainable for old products.

To find what elimination of products you would make after complete study of your unprofitable lines, products, markets or customers.

To find what wholly new classes of customers you can secure by such services as taking smaller orders or giving greater discounts, longer credit terms, premiums, generous return privileges, unusual guarantees, unusual deliveries, concessions on freight delivery charges or unrestricted service after sale.

To find what changes should be made in packaging design and construction, improving design and construction of old products to get better protection in transit, making them most suitable to the purchaser or for needs of distributors; thereby bringing in new markets. To find what products design is needed to make your package clear, distinctive, visible on shelf, counter or in show window to secure sales not previously attainable.

DEDUCTIBLE MARKETING STUDIES

To find what will give your product better labelling and so eliminate returns and complaints or make it more helpful to salespeople in procuring sales not previously attainable.

You can deduct marketing studies to aid in—Coordinating sales and production by forecasts of your volume, measures to reduce seasonable production, concentration on what to do with most unprofitable lines, reduction in variety and number of products marketed.

Determination of most economical sales distribution for your product (agents, jobbers, brokers, door-to-door, mail order, exclusive sales agencies, factory branches, etc.) and then formulating the most advantageous sales presentation and most useful promotion and advertising methods to aid that distribution.

Adoption of most effective promotion media after study of audience possibilities, merchandising opportunities, cost per unit of coverage, time factors, character and length of messages, useful life of the message, competition for attention, etc.—for most effective selling.

Stimulating sales by proper development of sales training programs for salesmen, scientific programs in conducting sales group meetings, adoption of modern sales compensation programs, full use of work stimulators in bulletins, contents, drives.

Restyling, repackaging, redesigning of product and package to secure wider markets and increase volume.

Changing customer services, customer credits, and other customer relations to enhance profits and eliminate abuses.

Organizing for most efficient, economical delivery methods by ascertaining the best process for shipping, greatest convenience to customers,

protection against damage or loss, speeding collections, suitability to size and weight of normal shipments, adaptability to shipping emergencies and to competitors' practices and customers' desires.

DEDUCTIBLE PRODUCTION STUDIES

You can deduct production studies that will tell you—What radically different or new manufacturing processes should be applied to give more efficient techniques of production, or create better sequence of manufacture or better pattern of fabrication?

What parts or assemblies formerly farmed out to others can be made by you; or what parts previously made by you should now be contracted out?

What you should do to get full control of wastes, spoilages, sale of by-products, thefts, or elimination of corrupt management or those whose interests conflict with the aims of business?

What new war developed material changes should be introduced (plastics for metals, etc.)? These may necessitate new manufacturing techniques and operations.

What changes are needed to give specialization of labor, use of unskilled labor for skilled labor; less labor and more capital per unit of product, etc.?

How can you get better planning, scheduling or routing techniques and sequences?

What incentive payroll systems, pension or profit-sharing plans should you have that will make major improvements in productivity of labor and result in increased efficiency, less deadwood, less labor turnover, less spoilage and greater employee loyalty and effort?

How can you create better health and accident prevention facilities—medical care, heating, ventilation, illumination, sanitation, fire prevention and similar protection to reduce turnover and absences?

How can you introduce far-reaching plans for stabilizing employment and controlling seasonal and cyclical let-downs?

How can you get a considerate and orderly hiring procedure, a wage schedule in harmony with the general wage levels for similar work in the community and the industry; a definite procedure for promotion, lay-offs and dismissals; specific rules and regulations pertaining to hours, overtime, vacations, discipline, etc.? This involves, too, an orderly step-by-step procedure for prompt, impartial consideration and adjustment of misunderstandings and grievances and a specific program and definite policy for the selection and training of supervisory personnel. It may involve a new method of informing employees on company policies, problems affecting employment relationships and the continuity of employment. It may require a method of publishing statements of company policies and practices, clearly stated and defined, so that all individuals in the organization will fully understand the terms and conditions of the employment relationship.

How can you secure control of quality through a thoroughgoing system of standardization, inspection, etc.?

How can you organize: to reduce the costs of stores and supplies; to secure the lowest maintenance and repair costs; to harmonize purchasing activities with production departments, to secure lower costs and avoid shortages?

You can deduct many other studies that may be highly important to your post-war profits. For example: What correction of high costs related to competition and sales possibilities is essential? How should you plan to adopt new techniques and modes of operation, reduction of idle plant capacity and elimination of dead-wood personnel?

What new key personnel will it be important to have, so that new direction or new impetus is given to the business or to important income-producing elements?

Should you remove your business or important departments from one location to another to secure proximity to sales, markets, sources of capital, credit, supplies, abundance of labor, cheaper labor, less unionization, less labor dissatisfaction, more employee productivity, adequate employee transportation, more certain power or water supplies, added prestige or advertising value, less restriction on sales in regulatory legislation, less price control or less local inspection?

Should you abandon your policy of selling wholly for cash and sell exclusively on long term credit, or vice-versa?

Should you arrange now for a bank or other financial institution to finance your sales of durable consumer goods (refrigerators, furniture, sewing machines, home-modernization services, etc.) instead of continuing to restrict such sales to the limits of your own ability to finance?

Should you convert your retail business from credit and cash-and-collect system to a vigorous cash-and-carry, cut-rate business?

Should you convert your privately owned business into a "mutualized" or "cooperative-like" business — by making your customers profit-sharers, investors and in a measure co-owners?

Should you have merchandise-suppliers finance your business by means of cash, long term credit, profit-sharing setups or the consignment system?

Ceylon Coconut-Oil

Production of copra in Ceylon for the 1944 season is estimated at about 245,000 short tons, as compared to 300,000 tons for the previous year. Roughly, half is exported as copra, and the other half is pressed for oil.

The war situation has cut into the production of oil. A yield is expected of 95,000 tons this year, which is about 30 per cent less than the year before. A downward trend is expected for some time to come. Domestic consumption is expected to amount to 40 to 50 per cent of production.

Copra exports were reduced radically under the record level of 1943.

Spanish Olive Oil

The past year has seen an unusually large olive crop in Spain, and this has resulted in an extraordinarily large production of olive oil. The quantity of oil shipped from Malaga during June, 1944, amounted to 8,794,488 kilograms, compared to 3,809,946 in June of last year. Shipments for the first half of the year were 41,456,955 compared to 21,359,723 kilograms for the first half of 1943.

Shipments of nonedible olive oil from the same port amounted to 88,624 and 77,701 kilograms for the same months, and 337,232 and 857,980 kilograms for the corresponding six month periods.

Short Adages

by R. O'MATTICK

THERE will be few, if any conventions this year, which among other things gives us an opportunity to picture a world without conventions. Much depends on the kind of convention — the time and the place and most of all the place—whether or not the conventions are missed.

Dr. Rowmateral, who in the halcyon days of the pre-war years, attended over a dozen conventions from January to December, will drink less, sleep more, shake hands with fewer people he doesn't know and will never meet again, and spend more time in his home. He is one of the many who always wonders why these conventions, yet he never misses one if he can help it. We look forward to seeing him and you and you at the first convention to be held after the war is over. It will be the greatest and best convention ever.

* * *

Believe it or not, a young lady named Lily is in charge of a perfume experimental laboratory in one of the essential oil houses—another employs a Rose and a third a Violet. Muguet, Geraniol and Ionone say we.

* * *

Virginia Pope, who knows a great deal about such matters, reports in the New York *Times* that colors will play a great role in the spring fashions and that the dominant color will be pink. Perfumes certainly tie up with fashions. Pink Orchid Perfume is already on the market!

* * *

The BIMS annual dinner at the Lafayette in New York could not possibly be the same as it always is with Martin Schultes, its leading light, home because of illness. Many tributes were paid to Martin but the greatest was the unpremeditated lack of gaiety.

* * *

One of Dr. Rowmateral's friends called him up to find out what they are asking for patchouli oil so that if he should get hold of some he would know what to ask for it in exchange for neroli which someone else was trying to get so that he could trade it for patchouli. The first fellow could only get patchouli if he could offer neroli for it and the second could only get neroli if he had patchouli to give for it and since neither of them had any neroli or patchouli nor diethylphthalate for that matter—nothing was done because nothing plus nothing equals nothing not only in the axioms of geometry but in the essential oil business as well as discovered long ago by your humble servant, R. O'Mattick.

June writes about these things shows that she does have them on her mind.

* * *

Otto Stock has been taking inventory recently in Dr. Rowmateral's laboratory. He made a list of all the essential oils and aromatics that they haven't got. It looks like a catalog of an essential oil house in the prewar days.

* * *

But one thing they have got is courage. They just keep on working along.

"Could you take on a job for private enterprise just this once and get us the secret formula of the Jones Co.'s cold cream?"

We have seen many things done with benzene rings but the most amusing is the drawing in an ad of Koppers Company, Tar and Chemical Division.

* * *

We have examined a few bottles of perfume which have come over from France. We did not really know what to expect so we cannot say that we were disappointed but these perfumes certainly do not contain flower oils.

* * *

June Ipère, who is spending a well-earned vacation in Florida and who during her working hours does a multitude of things at the office of one of the essential oil houses, writes from the sunny beach that some of the things not on her mind right now are: (1) keeping track of returnable containers, (2) the correct spelling of monomethyldiphenylethylacetal, (3) the cost of 3⅝ ounces of an oil at $46.13 per kilo. But the fact that

Pat Chouli has not been around for a number of months and Sand L. Wood is in hiding—why, we do not know. We would appreciate hearing from any of our readers who know where Pat and Sand are keeping themselves.

Cuban Sugar Production

The 1944 sugar crop in Cuba was the third largest in the history of the country. Its value will be about $326,000,000, the highest since 1924. By weight, it is estimated to be 4,750,818 short tons. Since there will be practically no carry-over, the 1945 crop is expected to be decreased.

Madagascar Tariff Controls

Madagascar has now placed beeswax and cinnamon bark, together with other items, on a list which makes them available for purchase through normal trade channels, subject to license requirements and shipping space.

Cosmetic Trends in the Middle West

Hints for spring fashion in cosmetics . . . An improved product coupled with the hosiery situation finds the more conservative woman a potential leg make-up user

by JEAN MOWAT

PINK is the spring trend for all cosmetic tints for the coming month. The first swing to this became apparent the last of January. Possibly the heightened color in one's face with zero winds may have made one realize that there was beauty in the tone. Anyway, pink, say the predictors, is here for the spring.

Zero weather, combined with new word on rationing, reduced current sales in most cosmetic sections. Departments handling items now anticipated as being short have been besieged by customers, and anticipated January quotas lagged. The reaction to all this has been reflected in the columns of newspapers where national advertisers of treatment creams and finer powders have been conducting campaigns throughout the entire middle west. Buyers do admit that their depleted sales help has not given them much of a chance to follow up these promotions, and sales are made directly on request.

Early in February buyers in this area will be in the various markets to study new trends. The new colognes are reported hereabouts as being something worth stocking. At this time few buyers are doing any gambling as to an increase in orders of leg make-up, but they are watching the situation to see what the tight supply of hosiery may produce. Although it may be too early to consider leg make-up now (most buyers have been too busy with inventory and planning post-inventory sales to look far into the future), a number of buyers report that they have sufficient stock on hand to begin a new season, even if warm weather should come suddenly, as it does in these parts following a zero spell. Popular-priced chains do not expect to see any increase in sales for leg make-up. On the other hand, style stores report that the marked improvement in the product, and with clever demonstrators and well-instructed sales people, a new class of women may accept the style for warm days, merely to save hose. Many conservative women have admired the idea but still hesitate accepting it. Opinion is general that the hosiery situation will force this group into leg make-up, but that it will be applied with great caution. The result in the latter case is surprisingly natural.

WHAT—NO DEODORANTS?

Nine cities in the middle west have omitted all mention of deodorants as a mid-winter item. During the hot weather this is a featured item in powder, stick and liquid form. It would seem that if ever there were a time when these preparations were needed it is when windows are closed, and offices, workshops and stores receive only an occasional breath of fresh air. Is it merely because one seems to perspire more in warm weather than in cold that the idea is used? Unfortunately, if you are one of those with a normal odor sense you will certainly wish that in all closed places, from churches, to theatres, to concerts, some one would put up signs stressing the high importance of using this cosmetic during cold weather. It is an essential to decent, fresh, living.

Some buyers contend that the tremendous sale of perfumes might be one reason for a budget's reduction in deodorants. Yet these same buyers complain that cologne (cream and liquid) types have fallen below normal, and perfumes are far down in the scale. For February, perfumes will be given a Valentine's Day boost, and this will indirectly be reflected in cologne sales.

When ten major cities in the middle west all plug treatment creams of national reputation during the same week, it means that Old Man Winter has, and is, getting in nippy work on faces, and making them tender and dry. Not only have stores given extensive space to these creams but manufacturers have stressed the importance of keeping skins soft and like satin. In this middle west section any woman who can achieve that by giving herself facial treatments hits a high point in fine dressing, but many of the career women do.

When the mercury touched five below in Chicago the early part of January, the *Hub* came out with a full page ad announcing that it now offered the complete line of Frances Denney preparations. A year ago the cosmetic section in this store was confined to three small counters. Today more than this space is required for the Denney stock and display, indicating what can be done by capitalizing upon the traffic lanes of an important men's store. For Valentine's Day, there will be captivating boxes, and cleverly tied packages of treatment cream, powder and cologne, featured for the gift of love.

Detroit has given much space to treatment creams. The January discount business has been brisk on many of the national brands. Hudson's suggests that not only is a cream important for the face, but when used on arms and legs it eases chapping. Heels might well have been added, for with only a thin covering, many women complain of great cracks. Few creams offer sufficient oil to replace that lost through daily showers and cold weather, so a highly important part of the anatomy goes without much creaming.

Kansas City makes a point of both creams and wind lotions, and all other prairie towns are following this

plan. The Twin Cities give stress to oils for relieving chaps and keeping the skin in good weather condition. Treatment creams have an important place in every budget.

St. Louis with a milder climate, but one which is smoky due to present heating conditions, places major stress on hand creams, super-fatted soaps, oil shampoos, and recommends the purchase of treatment creams in pound sizes so that one will have ample supply for both day and night use. While this center, as do many other cities, gives accent on the use of a day and night cream, not much emphasis is placed on the importance of cleansing creams.

TREATMENT CREAMS

Lack of cleansing tissues is generally conceded by buyers as one reason why women have discontinued the use of this important factor in skin care. Toilet tissue (on which there is no restriction at the present time) can serve in lieu of cleansing tissue, and soft cheesecloth and old linen may also be used. At least it should provoke some manufacturer into producing some type of absorbent to meet this need. Possibly an improvement in current tissues can be made; there is certainly room for it. During January, Goldblatt's advertised tissues, limited one box to a customer, and no mail or phone orders were accepted. Production has been greatly curtailed, due to the special machinery needed for the manufacture of this cleansing paper. This was the first ad to appear in many weeks.

POWDER NEEDS PROMOTION

National advertising throughout the larger cities of the middle west has given considerable stress to the smartness of powder. Only a few stores have followed through, but where this has been done good sales are reported. Most stores let powder sell itself, but cake powder is given considerable general store advertising.

Women continue to complain that powder does not stay on, and so they try the compressed form with little improvement. Few stores push powder in combination with a base cream and a good cleanser, but where this has been done it has resulted in repeat sales. Hudson's, of Detroit, is one store that made this three-point sale, although a number of leading houses feature rouge and powder. Talcs are slow outside of men's departments.

Charles Mayer & Co., Indianapolis, is sponsoring an idea that every store in the country should adopt, and which may be a tip for a manufacturer to apply to his product. This is a hospital, or convalescent, bit of cheer. It is to package toilet water, bath essence and a shaker-top talc in a smart box. Three scents are offered so that a choice may be made for the convalescent. Nothing is more refreshing for the hospital than a bottle of cologne, and a few drops in water gives a delicious fragrance to the room and refreshes the patient.

Cold weather and high winds have stressed the need for bath softeners for water. A handful for the basin is sufficient, but little promotion has been done on this item. Wrisley's sent a note to beauty editors suggesting its use in washing fine lingerie. Results were excellent. There is also a chance to promote this item to relieve after bath itchiness in hospitals or home illness. Bags, non-existent before Christmas, are now offered on aisle tables.

GETTING YOUR MONEY'S WORTH

National ads have been telling more than usual. When a nail polish firm advertised its new tint, this was done in bold lettering, and the entire line of preparations was included in the story of the new color. Carson Pirie & Co. is one of the few firms that has adopted this idea in Chicago, and finds it productive of more volume selling.

While there has been little national advertising, and scant attention given to the importance of a cream base for powder in the colder sections of the country, buyers who are alert to trends assert that more of this is being sold than formerly. Often the sale is made because of a combination offer. More of these offers may be made during the remainder of the cold weather. Even for summer, the base is highly desirable for tone and skin protection.

While treatment creams are stressed for facial use they are also effective when used on the hands, as they retard chapping merely because the hands are made perfectly clean. A good lather and brush will ostensibly remove the top soil, but the cream gets into the pores and one is astonished at how much dirt is removed. For office workers it is highly important, and a campaign for the greater use of cleansing cream should be established. Tissue creams for the hands and elbows are highly recommended by several buyers who find this a satisfactory and sane way to up sales during the dull period of the year.

There is considerable interest in the experimental line which Armour's is producing, and which may increase in volume as soon as vital oils and essences are released. Containers are important, as Sperti can testify. The educational work of the latter is highly commended by buyers.

Beauty Shop Trade

Indicative of what may become a trend, a number of department stores are planning on joining together to form an independent association for the operation of beauty shops within their own stores. This is a departure from the standard practice of leasing space for the operation of shops by concessionaires.

The new group, which is expected to be formally organized in February, will have as a nucleus Lord & Taylor, New York, N. Y.; F. & R. Lazarus & Co., Columbus, Ohio; Marshall Field & Co., Chicago, Ill.; and Bon Marche, Seattle, Wash.

Other department stores which will probably be invited to join the group will be Wm. Filene's Sons Co., Boston, Mass.; Burdine's, Inc., Miami, Fla.; Rike-Kumler Co., Dayton, Ohio; Maison Blanche Co., Ltd., New Orleans, La.; Abraham & Straus, Brooklyn, N. Y.; Sanger Bros., Inc., Dallas, Texas; Frederick & Nelson, Inc., Seattle, Wash.; Wm. H. Block Co., Indianapolis, Ind., and Titche-Goettinger Co., Dallas, Texas.

It is expected that membership will be limited to about a dozen stores.

Overseas Gift Catalog

In the two years which the gift catalog system has been in effect over 2,000,000 orders have been sent in for the more than 200 items listed. The volume in money has amounted to $10,000,000 it was reported by the chief of the Army Exchange Service, Col. F. R. Kerr.

Firms were called upon to cooperate in making up the 1945 catalog in January.

Floral Oil Shortages Lead to New Discoveries

Search for new odors prompt investigation of hitherto unknown perfume compositions . . . The industrial uses of Spanish fennel oils studied

by DR. PAUL Z. BEDOUKIAN
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ALTHOUGH progress in many fields not directly connected with the war effort has been curtailed, the essential oil industry has made notable advances in the past year. Considerable work has been done in the examination of a number of new as well as commonly known essential oils, in the synthesis of valuable perfumery chemicals, and in many other fields which are of general interest to the trade.

FLORAL PERFUME OILS

Shortages of floral oils and the search for new odors have prompted investigations of hitherto unknown perfume compositions of some flowers. The odor of lily flowers[1] has been found to be due to phenylethyl alcohol and esters of linalool, terpineol and p-cresol. The spicy odor of tobacco blossoms[2] was found to be due to eugenol and free fatty acids. Experiments have been conducted for some time at the Puerto Rico Experimental Station for the extraction of absolutes from coffee flower.[3] The perfume obtained is reported to be remindful of the bouquet of jasmine, cassie and mimosa, but apparently no investigation of its chemical nature has been made up to the present. The natural fragrance of 1266 blossoms was studied and reported in a publication.[4]

RESEARCH IN ESSENTIAL OILS

Research in the non-terpenoid low boiling constituents of essential oils which occur in extremely small amounts has brought out some interesting facts which may be of much value in understanding the formation of terpene compounds in plants. It is significant that isobutyl alcohol and isobutyraldehyde, along with isoamyl alcohol and isovaleraldehyde found in a number of essential oils, are structurally related to isoprene. These compounds have also been discovered in low boiling fractions of Java citronella[5] and lavender.[5a] The occurrence of furfural, hexenols and hexenals with the above compounds may possibly suggest the sugars as precursors of odorous constituents in plants.

Three new and unusual compounds, namely; 3-methylcyclohexanol, 1-octene-3-ol[6] and dl-1,1,3-trimethylcyclopentan-4-one[7] have been found to occur in European pennyroyal (Mentha pulegium). Aniseed oil has been found to contain a number of hitherto undetected acids.[8] An interesting research in the composition of the essential oil and resinoid of lovage root has recently been carried out.[9]

PROGRESS IN SESQUITERPENES

Most of the important investigations and discoveries in the realm of monoterpene compounds were carried out in the latter part of the 19th and the beginning of the 20th century. Progress in sesquiterpenes, i.e., compounds containing fifteen carbon atoms, was very slow until comparatively recently. The discovery of the dehydrogenation reaction which proved to be of the greatest value in problems dealing with the structure of sesquiterpenes opened up new avenues of research in this field.

Systematic stepwise degradation of cedrene,[10,11] dihydroeudesmol[12] and caryophyllene[13] is continuing. The problems involved in the elucidation of the constitution of these compounds are difficult and are likely to take considerable time. Our knowledge not only of the structure but of the occurrence of sesquiterpenes is incomplete. A new sesquiterpene alcohol called shairol[14] from Ferule pyramidata remains to be fully investigated. Another sesquiterpene from cedrus atlanta leaf oil has been reported recently.[15] The position of the double bond in isozingiberene has now been clarified.[16]

A class of extremely interesting compounds called the azulenes has been the subject of several recent investigations. They are bicyclic compounds of continuous conjugation which have an intense color and often impart a characteristic color to many essential oils. At least two new substituted azulenes[17,18] have been synthesized recently. A survey of the literature on the occurrence, composition and synthesis of azulene has been published.[19]

MUSK-LIKE COMPOUNDS

The familiar musk odor has been greatly valued by perfumers throughout the centuries. The chemical nature of animal musk and compounds possessing musk type odors has been the subject of numerous investigations. It is of interest to note that America now possesses the largest potential musk supply obtainable from muskrats. The chemical nature of the musk of Louisiana muskrat[20] was first reported in 1942. An excellent account of this work together with a historical survey of musk has been published.[21] Unlike the perfume obtained from musk deer which consists largely of large-ring ketones, the extract from muskrat was found to contain the alcohols rather than the ketones. Oxidation of these compounds yields the ketones.

It is worth mentioning that dried beaver castors[22] were also examined in the hope of obtaining musk type

This review is based principally on information obtained from the 1944 issues of the "American Chemical Abstracts."

compounds. Curiously enough, the extract yielded largely phenolic substances possessing no musk odor, and no large-ring alcohols or ketones.

The chemical synthesis of these large-ring compounds possessing musk odors began twenty years ago and continues to the present. Two isoambrettolides which differ from natural ambrettolide only in the position of the double bond have now been synthesized.[23] The synthesis of an other similar ambrettolide and natural civetone has also been claimed.[24]

A number of substitute tetralones have been made.[25] It is claimed that some of these have a sandalwood odor while others have an odor of musk and sandalwood.

Two isomeric sterols extracted from swine testes are reported to have a musk-like odor.[26]

A complete up-to-date story of synthetic nitrated musks including their history and development has been published recently.[27]

RESEARCH IN IONONES

There has been a revival of interest in the study of ionones and related compounds, possibly as a prelude to new attempts towards the synthesis of vitamin A. It is significant that a great deal of this fundamental work is being done in America, rather than on the Continent. Ultra-violet absorption studies of ionones and ionoles along with their homologs[28, 29] were carried out and as a result the spatial structure of these compounds were clarified. A critical study of experimental conditions necessary for the production of 100 per cent pure b-ionone has been made.[30] Alpha ionone has been successfully resolved into its optical isomers for the first time.[31] Many polyene derivatives of the ionones have been made[32] and critically studied through absorption spectra. Synthesis of b-ionylidenacetaldehyde which is considered the key compound for the synthesis of vitamin A has been repeated without success[33] pointing to the necessity for further study of this reaction.

RESEARCH IN CYCLIC COMPOUNDS

The problem of ring expansion of organic compounds has been an interesting subject for chemists. It involves the increase of a cyclic compound by one carbon atom, such as the formation of cyclohexyl compounds from cyclopentyl compounds. There has been a revival of interest in this type of reaction since the elucidation of the structure of the active principle of orris root oil, namely, irone, by Ruzicka. Possibly these preliminary efforts will lead up to the synthesis of 7-membered ring irone type compounds.

Ring expansion of dihydrogeranylamine through the Demjanov rearrangement was found to yield a mixture of substituted cyclohexanes and cycloheptenes.[34] Cyclononanone has been successfully made from cyclooctanone through Tiffeneau's reaction.[35] Through a similar reaction, a number of substituted cyclopentanone cyanohydrins have been converted to substituted cyclohexanones.[36]

A somewhat different type of reaction involving a change in the nature of the ring has been studied. It was reported that by heating the appropriate methyl decanolactone with phosphorus pentoxide, dihydrojasmone is obtained in 50 per cent yields.[37] The opposite of this reaction involving a change of jasmone type compound to its lactone compound has been carried out and found to yield a lactone possessing a stronger and similar type of odor.[38]

A number of new syntheses as well as improvements on known methods have been reported. The important role of aldehydes in the perfumery trade has been realized and considerable work done in this field. Anisaldehyde and heliotropine were condensed with heptaldehyde[39] to obtain compounds analogous to amylcinnamic aldehyde. It was indicated, however, that they were not of great value for perfumery purposes. The writer also prepared the former compound some years ago[40] and found it to be practically odorless for perfumery purposes.

A Russian patent reports the preparation of cyclamen aldehyde by electrolytic reduction of p-isopropyl-a-methyl-cinnamaldehyde.[41] A review[42] and a new general method for the synthesis of aromatic aldehydes[43] has been published. Detailed procedures for the synthesis of a-phenylpropionaldehyde and phenylmethylglycidic ester were recently reported.[44]

The conversion of pinene to oxygenated compounds has always been of theoretical interest and practical value. A report on the conversion of pinene hydrochloride to camphene[45] and camphene to isoborneol[46] as well as a critical study of the formation of borneol esters by the action of organic acids on d-a-pinene has been published.[47] Formation of thymol from metacresol has been the subject of a study[48] and a patent.[49] A very interesting article deals with the preparation of dl-menthol from thymol.[50]

A number of patents have been issued on the production of aromatic chemicals. Among these may be mentioned a preparation of 3-substituted homologs of indole[51] by heating indole under pressure with an alcohol and a solution of a corresponding alcoholate. Terpineol has been obtained from a tert-p-menthadiol by heating with a suitable carboxylic acid solution.[52] Isosafrole is produced by heating safrole with an alcoholic potassium hydroxide solution and distilling the alcohol from the reaction zone.[53] Production of vanillin from guaiacol is described in another patent.[54] An interesting compound of rare occurrence in some essential oils, namely aloocimene, is produced by heating a-pinene to high temperatures with a high boiling solvent.[55]

STUDY OF ANTI-OXIDANTS

Oxidation of essential oils which causes the development of off-odors and off-flavors has been a problem which has attracted the attention of many investigators. It is therefore not surprising that a number of studies have been made on the subject.

The stability of cinnamon oil as contrasted with the ease of oxidation of cinnamic aldehyde is claimed to be due to the presence of eugenol which serves as an anti-oxidant in the natural oil.[56] Optimum conditions for the storage of peppermint oils were investigated and the addition of 0.1 per cent catechol found to be effective as an anti-oxidant and preferable to hydroquinone.[57] The keeping qualities of American oils of turpentine and their optimum conditions of storage have been extensively investigated. A number of preservatives were tested and a comparative study made of their effectiveness.[58] It has been claimed in a patent that perfumes which are used in toilet or laundry soaps may be

stabilized by the addition of ascorbic acid or similar compounds.[59]

SEARCH FOR NEW SOURCES

As a result of the war, large sections of essential oil-producing countries have come under the control of the enemy. The industry has suffered particularly since the occupation of the East Indies by the Japanese forces. Shortages of many widely used essential oils have led to a search for available sources of similar or substitute oils.

The development of citrus products in Palestine has been progressing and data concerning orange oil, lemon oil, grapefruit oil and pectin have appeared recently.[60] Cultivation of Indian lemon grass oil is discussed in a recent publication.[61] A sample of geranium oil from the Belgian Congo has been found to have characteristics similar to Algerian and Reunion geranium oils. An oil obtained from eucalyptus citriodora had a citronellal content of about 75 per cent, which, however, was slightly d-rotatory, and therefore not suitable for the manufacture of l-menthol.[62]

A particularly interesting survey of Australian eucalyptus oils including their production, uses and chemical compositions has been published.[63] The composition and industrial uses of Spanish fennel oils have been investigated.[64] The oil of Myrrhis odorata is claimed to have a high anethole content and an anise-like odor.[65]

North Africa has long produced a wide range of essential oils. Studies have been made of a number of newer oils, including oil of rue,[66] oil of lavandula pedunculata,[67] oil of henna,[68] Algerian geranium oil,[69] oil of pennyroyal[70, 103] and French bitter orange-peel oil.[99]

Coriander has been successfully cultivated in Norway and is reported to have a higher yield of oil than plants cultivated in Central Europe.[71] Camphor basil cultivated in the Ukraine has yielded an oil containing 50-60 per cent camphor.[72]

Examination of oils obtained from peppermint (mentha piperita) in Canada has been reported.[73] An extensive report on the cultivation of mentha arvensis in Brazil and the characteristics of the oil was published recently.[74] Production of oil of lime in Florida[101] and grass oils in Central America[102] has been reported.

Very often the cultivation of a plant under different climatic conditions will cause unexpected changes in the nature of the essential oil produced. A small quantity of oil obtained from Angelica archangelica roots cultivated in Canada yielded an oil having an opposite rotation to samples obtained from European sources.[75]

SURVEYS ON ESSENTIAL OILS

The articles appearing in American trade journals deal in general with the cultivation, distillation and chemical and physical properties of many oils along with their industrial uses. Original data is occasionally presented for comparison with data found in the literature.

The following publications may be mentioned: Oil of Spearmint,[76] Oil of Pennyroyal,[77] Styrax and Oil of Styrax,[78] West Australian Essential Oils,[79] A Survey of Oil of Opopanax,[80] Oil of German Chamomile and Oil of Roman Chamomile,[81] Characteristics and Uses of Oil of Olibanum,[82] Survey of Oil of Myrrh,[83] Survey of Oil of Costus Root,[84] Survey of Oil of Erigeron,[85] A Review of Chemical and Physical Characteristics of Oil of Lovage,[86] World-wide Survey of Oil of Lavender,[100] A Survey of American and European Peppermint Oils,[87] Production and Characteristics of Oil of Anise,[88] A Survey of Oil of Guaiac Wood,[89] Oil of Red Cedarwood and Oil of White Cedarwood,[90] Oil of Chinese Star Anise[91] Asafetida and Myrrh,[92] Oil of Haitian Sweet Basil,[93] Lemon and Orange Oil and their Preservation,[94] Oil of Geranium,[95] Oil of Thyme.[98]

An excellent book on synthetic menthol containing a collection of the literature concerning its pharmaceutical properties and uses has appeared recently.[96] Another book very appropriately called Perfumers' Handbook and Catalog has been published and contains much useful information for perfumers.[97]

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Mint Prospects in Brazil

The area planted in mint, in Brazil, is estimated to be three times that of last season. Planting was late, because of the drought, and the first cuttings will be delayed. Planters hope to obtain three cuttings. If the weather remains good a very large crop is anticipated.

Panamanian Coconuts

The Panamanian coconut industry centers in the San Blas area. Approximately 200,000 coconut trees grow in the region, and produce about 14,000,000 nuts annually.

Prior to World War II the Indians sold a high percentage of these coconuts to commission agents for export. In 1941, however, because of shortages of fats and oils, especially for soaps, the Government prohibited the export of coconuts.

Timely Survey of Ocimum Oils

Detailed discussion of oils distilled from various Ocimum species . . . These essential oils have lately attracted the attention of dealers and consumers in this country . . . Some lots have already been imported

by DR. ERNEST GUENTHER

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THE most important essential oil of the *Ocimum* group is *Ocimum basilicum* L. (fam. *Labiatae*), the so-called sweet basil oil. It is produced in Southern France,[1] Germany, in other parts of Europe, and lately also in the United States.[2] A similar, but somewhat inferior oil containing some camphor, the so-called Réunion basil oil, is distilled mainly on the Comoro Islands and in Madagascar. The occurrence of still other but commercially unimportant basil oil types, containing as main constituents eugenol and methyl cinnamate, complicates the problem of basil oils.

Aside from *Ocimum basilicum*, there exist a number of *Ocimum* oils distilled from various *Ocimum* species which are comparatively little known. Some of them, however, contain substantial quantities of natural camphor and, since this product is no longer available from its source of supply in Formosa (Japanese camphor oil), the various *Ocimum* oils have lately attracted the attention of essential oil dealers and consumers in the United States. Offers are being received from British East Africa and the Belgian Congo, and some lots have already been imported. Therefore, a detailed discussion of these oils would seem timely.

OIL OF OCIMUM CANUM SIMS

Ocimum canum Sims occurs wild in tropical West Africa (Guinea, Ivory Coast, Congo), East Africa (Tanganyika, Mozambique, the Comoro Islands and Madagascar), in East India, Ceylon and tropical South America. In several places it has also been cultivated, but so far only on a small, mainly experimental scale. There exist two types of oil distilled from the plant, one containing methyl cinnamate as principal constituent, the other d-camphor. The latter type has been recommended again as a source of natural camphor, since the Japanese product (from camphor oil), which dominated the world's market for many years, became unavailable with the outbreak of World War II.

It remains uncertain whether the existence of two or maybe more types of oil must be attributed to local soil and climatic conditions or to different plant varieties, perhaps purely physiological forms.

A. METHYL CINNAMATE TYPE OF *OCIMUM CANUM* OIL

This type of oil has occasionally been produced on the Ivory Coast, in French Congo (Ubangi-Schari), in the Comoros (Anjouan) and on Madagascar.

Roure-Bertrand Fils[3] examined an oil distilled in Grasse from dried *Ocimum Canum* Sims imported from Dabakala (Ivory Coast). The yield was 0.65 per cent, the properties as follows:

Specific Gravity at 32°	1.0330
Optical Rotation at 30°	—2°30'
Acid Number	0
Saponification Number	301.4, representing 87.0% methyl cinnamate.
Solubility	Soluble in 2.25 vol. and more of 75% alcohol; soluble in 80% alcohol.

When standing at room temperature the oil deposited crystals in the form of long needles m.p. 35-37°.

Schimmel & Co.[4] examined a similar oil from Central Africa:

Specific Gravity at 30°	1.0431
Optical Rotation	—2°25'
Refractive Index at 30°	1.55611
Acid Number	0.6
Ester Number	289.8, representing 83.8% methyl cinnamate.
Solubility	Not clearly soluble in 10 vol. of 70% alcohol; soluble in 1.0 vol. and more of 80% alcohol.

The crystals separated from the oil proved to be methyl cinnamate m.p. 36°.

Two oils of *Ocimum canum* Sims distilled in Patsy, Anjouan (Comoro Islands) were described by Glichitch:[5]

SEE TABLE ON PAGE 50

These two oils were dextrorotatory, while the previously described oils showed laevorotation.

According to Glichitch and Naves[7] oils of *Ocimum Canum* Sims produced on the Comoros and in Madagascar contained 54.0 to 85.0 per cent methyl cinnamate, those from Ubangi-Schari (French Congo) 9.6 to 78.0 per cent.

In more recent years Joly[8] reported that the natives of French Ubangi use the dried, powdered leaves of *Ocimum canum* Sims against head colds. An oil distilled from the herb had the following properties:

[1] Guenther, "Oil of Sweet Basil," *Am. Perfumer*, June 1935, 183.
[2] Lowman, "Growing Sweet Basil in Virginia," *Ibid.*, April 1935, 76. Nelson and Lowman, "Chemical Composition of Sweet Basil Oil from Virginia," *Ibid.*, Dec. 1935, 69.
[3] Repts. *Roure-Bertrand Fils* Oct. 1913, 19.
[4] *Ber. Schimmel & Co.* April 1914, 72.
[5] *Parfums France* 1924, 314.
[6] *Ibid*, 1925, 139.
[7] *Chimie & Industrie* 29 (1933), 1029.
[8] *Parfumerie moderne* 31 (1937), 203.

Specific Gravity at 15°	1.045
Optical Rotation at 23°	+1°30'
Refractive Index at 20°	1.5484
Acid Number	0.68
Saponification Number	269.5, representing 78.44%* methyl cinnamate.
Congealing Point	+17.2°
Solubility	Soluble in 1.0 to 10 vol. of 85% alcohol.

* Should read 78.0% (Correction by the author).

Joly also observed that some oils distilled from *Ocimum canum* Sims contained a high percentage of methyl cinnamate, others very little.

CHEMICAL COMPOSITION

Glichitch[9] established the presence of the following compounds in two oils of *Ocimum canum*, methyl cinnamate type, distilled in Anjouan (Comoro Islands):

1% cineol	Hydrobromide m.p. 56°.
25% l-linalool	Phenylurethane m.p. 63-64°.
2% methyl chavicol	Homoanisic acid m.p. 85-86°.
0.5% geraniol	Ag salt of the acid phthalic acid ester m.p. 132-133°.
1% other alcohols (terpineol?)	These alcohols consist possibly of terpineol.
55% allocinnamic acid methyl ester and methyl cinnamate	Free acids m.p. 70-75°, and 133°, respectively. According to Glichitch and Naves,[10] Ocimum canum oils distilled in Madagascar and on the Comoros contain from 54 to 85 per cent methyl cinnamate, while those produced in Ubangi-Schari (French Congo) contains 9.6 to 78.0 per cent of this ester.
0.5% fatty acid esters C_6 to C_8	Analysis of the Ag salt.
10% of a bicyclic l-sesquiterpene (?)	
4% of an apparently tricyclic d-sesquiterpene (?)	

The oils examined by Glichitch differ considerably from a camphor-containing type of oil which had also been produced in Anjouan (Comoro Islands).

Rakshit[11] described an oil distilled (yield 0.38 percent) from the stalks, leaves and flowers of *Ocimum canum* growing wild in the northern parts of British East India. The chemical composition of this oil was quite different from that described above; it contained the following constituents:

about 50%	citral
" 10-16%	citronellal
" 15%	linalool
" 5%	methyl cinnamate
small quantities only	eugenol, acetic acid, citronellic acid, phenols (?), terpenes (?)

Two Oils of Ocimum canun Sims as Described by Glichitch

	I	II
Specific Gravity at 15°	0.9870	0.9942
Optical Rotation at 23°	—5°4'	—3°50'
Refractive Index at 20°	1.52492	1.52494
Acid Number	0.42	0.70
Ester Number	186.2, representing 54.19%* methyl cinnamate.	194.6, representing 56.30% methyl cinnamate.
Ester Number, after cold formylation	280.0	273.67
Free Alcohol Content, calculated as $C_{10}H_{18}O$	29.99%	25.18%
Congealing Point	+6.2°	+6.3°
Solubility in 75% Alcohol	Soluble in 1.0 to 1.5 vol.	

Antoine Chiris[6] reported about two oils of Ocimum canum Sims from Bambari (French Congo):

	I	II
Specific Gravity at 20°	1.0412	0.9484
Optical Rotation at 23°	+1°30'	+3°36'
Refractive Index at 20°	1.54842	1.49490
Acid Number	0.68	0.22
Ester Number	269.5, representing 78.44%** methyl cinnamate.	101.15, representing 29.26% methyl cinnamate.
Congealing Point	+17.2°	—
Solubility	Soluble in 2.5 vol. of 70% alcohol; soluble in 0.6 vol. of 85% alcohol.	

* Should read 53.9% (Correction by the author).

** Should read 78.0% (Correction by the author).

EMPLOYMENT

If produced at sufficiently low prices, oils with a high content of methyl cinnamate could be used for the isolation of this ester. The oil may be employed in perfumes, cosmetics and especially for the scenting of soaps. So far, however, oil of *Ocimum canum* Sims, methyl cinnamate type, has not attained any commercial importance.

B.
CAMPHOR TYPE
OF *OCIMUM CANUM* OIL

Charabot[12] called the attention of the essential oil industry to the fact that the oil distilled from *Ocimum canum* Sims contains a high percentage of d-camphor, and suggested cultivating this plant as a new source of natural camphor. Similar oils from Mayotte (Comoros) were reported by Schimmel & Co.[13] Later Charabot[14] isolated by simple freezing about 35 percent d-camphor from an oil produced in Kenya Colony, the residual oil still containing substantial quantities of camphor in solution.

According to an official French report[15] experimental plantings of *Ocimum canum* Sims were undertaken in the Comoro Islands. One hectare gave twelve to thirteen tons of fresh herb which upon distillation yielded sixty-one kilos (0.47 percent) of oil. Twenty kilos of camphor could be isolated from these sixty-one kilos of oil.

Experiments with *Ocimum canum* Sims proved, according to Nesterenko,[16] that this plant can be grown successfully in the southern and central sections of the Ukraine, in Tschernosem (the very fertile part of Central Russia), and in the Northern Caucasus. One hectare produced about eight to ten tons of herb which yielded fifty kilos of oil containing thirty to thirty-five kilos of d-camphor. The plants can be harvested once in the northern regions but twice in the south. Depending upon the age of the plants, the oil yield varied from 0.46 to 0.56 percent, calculated upon the fresh herb. The camphor content of the oil increases in fall; an oil obtained during the August harvest contained 47 percent camphor, an oil distilled in October, 74 percent. Nesterenko came to the conclusion that large quantities of camphor could be produced in Russia from *Ocimum canum* Sims.

Rotermel[17] reported that 1,000 kilos of fresh herb *Ocimum canum*

[9] *Parfums France* 1924, 314.
[10] *Chimie & industrie* 29 (1933), 1029.
[11] *Perfumery Essential Oil Record* 29 (1938), 402.
[12] *Bull. Jardin Colonial* 1903. — *Repts. Roure-Bertrand Fils* April 1903, 33.
[13] *Ber. Schimmel & Co.* April 1908, 123.
[14] "*L'Ocimum canum*, source naturelle de camphre droit." *Acad. d' Agriculture de France* (Extrait du Procès Verbal de la Séance du 21. Décembre 1927).
[15] *L'Argronomie Coloniale* 18 (1929), 85.
[16] "*Ocimum canum* Sims." Report Government Botanical Garden, Nikitski Yalka, 1934; through *Ber. Schimmel & Co.* 1935, 53.
[17] *Sowjetskaja Pharmacija* 5 (1934), No. 5.

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var. *camphoratum* gave 7.67 kilos of an essential oil with the following properties:

Specific Gravity	0.934
Specific Optical Rotation	+10°3'
Refractive Index at 65°	1.4940
Acid Number	0.2
Ester Number	188.2
Melting Point	64 to 72°

At freezing temperature 54.0 percent camphor separated from the oil.

Steam distilling the flowers and floral stalks of *Ocimum canum* Sims collected during January and February in British East India, Sanjiva Rao, Mathen, Kelkar and Jagjit Singh[18] obtained 0.22 to 0.30 percent of oil from the dry herb, and 0.13 to 0.21 percent from the fresh herb. The oils had a mild camphoraceous odor and had properties varying between the following limits:

Specific Gravity at $\frac{30°}{30°}$	0.9205 to 0.9249
Specific Optical Rotation at 30°	+ 23° 48' to + 31° 42'
Refractive Index at 30°	1.4830 to 1.4865
Acid Number	0.6 to 1.5
Ester Number	4.5 to 5.5
Saponification Number after Acetylation	39.3 to 44.8
Solubility	Soluble in 0.5 vol. of 90% alcohol.

Gaponenko and Bering[19] distilled 200 kilos of air-dried and pulverized *Ocimum canum* Sims and obtained by fractional distillation 1.20 kilos of crystallized and 2.50 kilos of liquid fractions. The latter were cooled to yield an additional crystalline fraction. The total yield of oil was 1.85 percent as calculated upon the air-dried herb. It contained about 66.00 percent crystalline constituents which in turn consisted of 99.16 percent of camphor and 0.84 percent of borneol. Borneol was separated from camphor as tribornyl borate.

Beckley[20] distilled *Ocimum canum* Sims growing in East Africa and obtained 0.6 percent of an oil which upon cooling separated 16.0 to 25.0 percent of camphor.

Radilevski[21] reported that *Ocimum canum* Sims cultivated in the U.S.S.R. yielded as much as 100 kilos of camphor per hectare. The essential oil of the plant contains from 50.0 to 60.0 percent of camphor. The physiological action of synthetic l-camphor is equivalent to natural Japanese d-camphor.

AFRICAN OCIMUM CANUM OIL

According to Thomssen[22] *Ocimum canum* Sims, formerly called *Ocimum Americanum*, is a hardy perennial which so far has not suffered from any known disease. Herbivorous animals refuse to eat it. The stalk is killed by frost, but moderate cold does not destroy the entire plant. The seed is very small, about one millimeter long, black and plum-shaped. A row of plants one foot long usually produces enough seed for planting a twenty-foot long row.

Thomssen reported that *Ocimum canum* Sims, called "Kisi" in Kenya, produces seed every three months under ideal East African climatic conditions from small mauve flowers resembling those of sweet basil.

The planting is done by drilling seed rapidly in the same type of mechanical seeder used for grain. In proper climates, the plant can be permanently seeded in rows about three feet apart so as to permit cultivation from time to time. When the seed germinates ample watering is necessary. It takes about six months for the shrub to grow from the time of the first planting until the blossoming. After the harvest, the regrowth is more rapid and under proper climatic conditions occurs every three months.

In order to obtain a maximum of oil, the plant should not be cut before complete maturity.

Under normal conditions the first harvest, six months or less after planting of the seeds, produces seven tons of cuttings per acre. After the first cutting, the root system develops more fully and the foliage becomes denser with each harvest. The second cutting increases 40 per cent, and the third cutting 100 per cent over the first harvest. Thus, it has been estimated that from 40 to 50 tons of branches and leaves may be produced per acre under proper conditions.

Volcanic soils seem to favor the development of camphor in the plant. The refuse matters from the stills can be employed for fertilizing.

The total yield of oil, as calculated upon the green over-ground parts, varies from 0.5 to 0.8 per cent during and after maturity of the seed.

Distillation is carried out in the usual way, 20 to 25 liters of condensed water being required to carry off 3 kilos of oil.

The oil is a semisolid mass containing about 65 percent camphor and 35 percent liquid. The camphor can be separated by cooling and centrifuging, whereby about 65 percent of pure crystallized camphor may be isolated. The oil separated from the camphor resembles oil of eucalyptus.

The crystalline white camphor isolated from *Ocimum canum* oil has the same physico-chemical properties (m.p. 178°, optical rotation +40° 8' in benzene) as the camphor obtained from Japanese camphor oil.

[18] *Perfumery Essential Oil Record*, 28 (1937), 412.
[19] *Farmats. i Farmakol.* 1937, No. 4, 17.—*Chem. Zentr.* 1938, I. 935.
[20] *East African Agr. J.* No. 1 (1936), 469.
[21] *Farm. Chzhur.* 11, 1, (1938), 27. — *Chem. Abstracts* 33 (1939), 316.
[22] *Drug & Cosmetic Ind.* Nov. 1938, 547.

Lemongrass Plants to Russia

The War Food Administration has purchased 1,000 lemongrass plants in Florida for the Russian Government. It is not known to what use they will be put as it is generally felt that the climate there is too cold for the commercial production of lemongrass oil.

One of the largest commercial producers of lemongrass in this country is the United States Sugar Corp., which has several thousand acres under cultivation near Clewiston, Fla. This corporation has developed machinery for the harvesting and distillation of the grass. As a final step the grass is ground, after ditillation, and mixed with the residue from the sugar refining, to be sold as cattle feed.

Brazil's Lemon Oil Supply

Output of lemon oil in Sao Paulo, Brazil, during 1944 is estimated at 10 tons, says the foreign press. Carry-over from previous years is reported to be 10 tons.

Packaging Portfolio

ELIZABETH ARDEN

ELIZABETH ARDEN: A new case of white plastic has been provided for the new vibrant red lipstick, Winged Victory. Beneath its shining lucite top is the golden Arden emblem. A complete color harmony has been evolved; one of the most important features being the Winged Victory nail polish keyed to the lipstick color.

DAGGETT & RAMSDELL: Mountain Heather cake make-up is an addition to the group of cosmetics bearing that name. This combination of powder base and cake make-up is encased in a pink heather-decorated container and is available in five shades.

DAGGETT & RAMSDELL

HELENA RUBINSTEIN: Hormone Cream packaged in a sturdy white jar and Hormone Oil in a simple glass bottle are two new scientific preparations for the more mature skin. A spoon which measures the exact quantity of the cream to be used is supplied with each package.

HELENA RUBINSTEIN

HOUSE OF IMPERIALE RUSSE

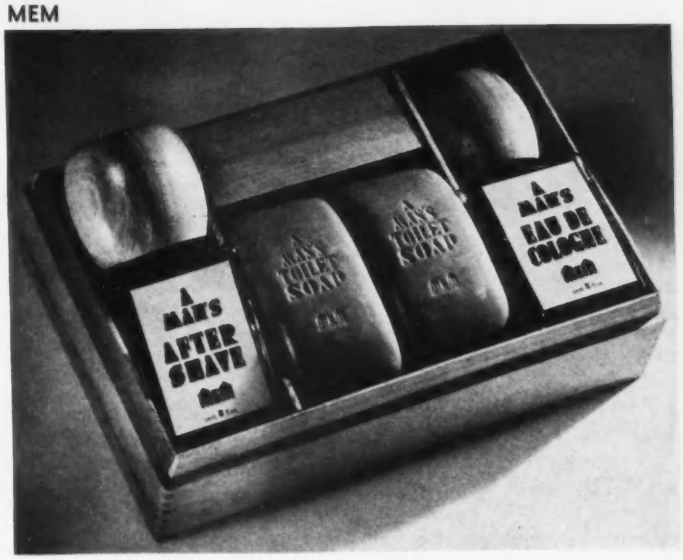
TUCK-AWAYS

HATTIE CARNEGIE

HOUSE OF IMPERIALE RUSSE: The individual sachets come in tablet form, guest soap size and are colorfully wrapped. The unusual design showing the heraldic devices of the Russian Court was picked up from the box design and from the label of Essence Imperiale Russe.

TUCK-AWAYS: A new type of perfumed sachet in the form of dainty paper packets measuring about 3½ inches across, are announced by the Trimz Co., Inc. Each packet is colorfully decorated with flowers matching the fragrance. The shipping container also serves as a counter display and dispenser.

MEM



HATTIE CARNEGIE: The famous clothes designer launches a complete new line of cosmetics packaged in pale blue jars and bottles which carry the Carnegie crest embossed in white. These cosmetics also feature an active ingredient cream which contains natural estrogenic hormones.

MEM: A trio of toiletries for men is packaged in a rugged red wood box containing one bottle of after shave, Eau de Cologne, and two rotoformed hand soaps in pine or sandalwood. The bottles are topped with wood caps making them easy to grasp as well as a handsome addition to a man's array of personal articles.

Technical Abstracts from Scientific Literature

These brief abstracts listed provide a convenient key to current scientific literature of the world on perfumes, cosmetics, soaps, dentifrices and other preparations

Analysis of Soap-Synthetic Detergent Mixtures in Bar Form. *D. Berkowitz & R. Bernstein. Anal. Ed. Ind. & Eng. Chem.* **16**, *239, 1944.*

A procedure for the analysis of commercial soap-synthetic detergent mixtures is proposed which has given sufficiently accurate and reproducible results. The sample is extracted with 95% ethyl alcohol to remove the major portion of the active ingredients, followed by solution of the alcohol-insoluble salts in water and reprecipitation of them by the addition of excess ethyl alcohol. Soap, fatty matter, and alcohol-soluble chlorides are determined directly, synthetic detergent being determined as the difference between total alcohol-soluble matter and the sum of soap, fatty matter, and alcohol-soluble chlorides.

Process of Forming Alcohols. *U. S. 2,340,687.* The process of forming fatty alcohols comprises subjecting to reaction with hydrogen at a temperature between 240° and 400° at a hydrogen pressure above 2000 pounds per square in a mixture of soaps of fatty acids corresponding to said alcohols, said mixture consisting of soaps of cadmium and copper. (Through *Oil and Soap* **21**, *213, 1944.*)

Natural Fragrances. Arno Muller. *Seifensieder-Ztz.*, **69**, *336-8, 1942; Chem. Zentr., 1943, I, 1829-30.* Approximately 5 per cent of the 1266 blossoms studied possessed fragrances having a heliotrope-like quality. Of these, approximately 14 per cent closely resembled heliotrope blossoms in odor. The heliotrope fragrance is complex (heliotropin odor with a by-odor). Pure heliotropin fragrance is rare; it is purest in *Poterium villosum Sibth. and Sm.* Fragrance characteristics are given for a number of plants that represent this type of odor. Approximately 2.8 per cent of the blossoms studied had more or less pronounced honey fragrance. Typical representatives of the plant kingdom possessing a predominant honey fragrance and modification of honey fragrance are given. No honey fragrance was found in 738 leaves studied. The fragrance complex of cedar wood (*Juniperus virginiana*) was found in 1.44 per cent of the blossoms studied. Of the 738 leaves studied only *Majorana hortensis Mnch.* possessed a cedar fragrance. Fragrance characteristics are given for a number of plants of this odor type. Carrot fragrances were found in 2 per cent of the leaves, but not in the blossoms studied. Plants possessing carrot fragrance are enumerated. (Through *Chemical Abstracts* **38**, *3797-80, 1944.)*

The Toxicity of Solvents Used in Cosmetics. Jaroslav Hojka. *Casopis Mydlar Vonavkar*, **20**, *99, 107-8, 114-16 (1942)*; *Chem. Zentr., 1943, I, 1113.* A description of the solvents used in cosmetics (acetane, amyl acetate, amyl alcohol, benzene, petroleum ether, ethyl acetate, ethyl alcohol, glycol, ether, carbon tetrachloride, iso-propyl and butyl alcohol, methyl alcohol, tetra- and pentachloroethanes, tri- and -tetrachloroethylene) on the basis of physical and chemical properties and their dangers. (Through *C. A.* **38**, *3677, 1944.*)

"Vital Sulfur." A Model for the Limiting State Between Solid and Liquid. F. Wratschko. *Wien. pharm. Wochschr.*, **76**, *31-4, 1943; Chem. Zentr., 1943, I, 1650.* The colloidal sulfur preparations designated as "vital sulfur" are prepared: Mix 100 parts of sulfur powder with a solution of 1 part of acacia in 56 parts water for 20 hours in a ball mill, remove from the mill, dilute with 3 times the amount of water, agitate well, and, after standing, siphon off the sulfur milk. (Through *C. A.* **38**, *3779, 1944.*)

Recovery of Excess Glycerol in Residues from the Preparation of Mono- and Dimethyl Ethers of Glycerol. *U. S. 2,339,047.* In a process in which dimethyl sulfate and sodium glycerate are caused to react in the presence of an excess of glycerol, to form methyl ethers and a normally unfilterable, amorphous Na sulfate-glycerol mixture, and the ethers formed are distilled off, sufficient water is added to the distillant to convert the sodium sulfate to hydrated form, the mixture is heated to crystallize the hydrated sulfate, the aqueous glycerol is filtered off from the crystalline sulfate, and the water is distilled from the glycerol.

Aluminum Tubes and Their Use in Dispensing Sterile Petrolatum. Knud Nilou. *Dansk Tids. Farm.*, **16**, *270-5 (1942)*; *Chem. Zentr., 1943, I, 1494; cf. C. A.* **38**, *3096.* The covering power of a shellac layer was tested with 10 per cent mercuric chloride solution or with the help of a galvanoscope. Sterilization tests on empty tubes and those filled with petrolatum at 155-65° showed no change in the tube when pressure tests were applied. Experiments indicate that tinned lead tubes can be replaced with aluminum tubes. (Through *C. A.* **38**, *3777, 1944.*)

Use of Cationic Soaps. A. I. Mateskii and F. I. Raikhlin. *Tekstil. Prom., 1941, No. 5, 35-6.* Cationic soaps were prepared from cetyl and octodecyl alcohols and mixtures of high-molecular alcohols produced from cottonseed oil and seal oil. The following compounds were used as bases: pyridine, pyridine bases (b.p. 142-53°). trimethylamine, diethylaniline. Experiments in the washing of wool and dyeing of cotton—and half-wool material showed cationic soaps are valuable products, and their use in the dyeing and finishing of fiber is desirable. (Through *Oil & Soap*, **21**, *250, 1944.*)

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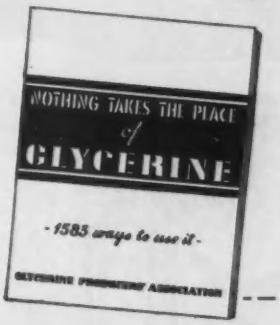

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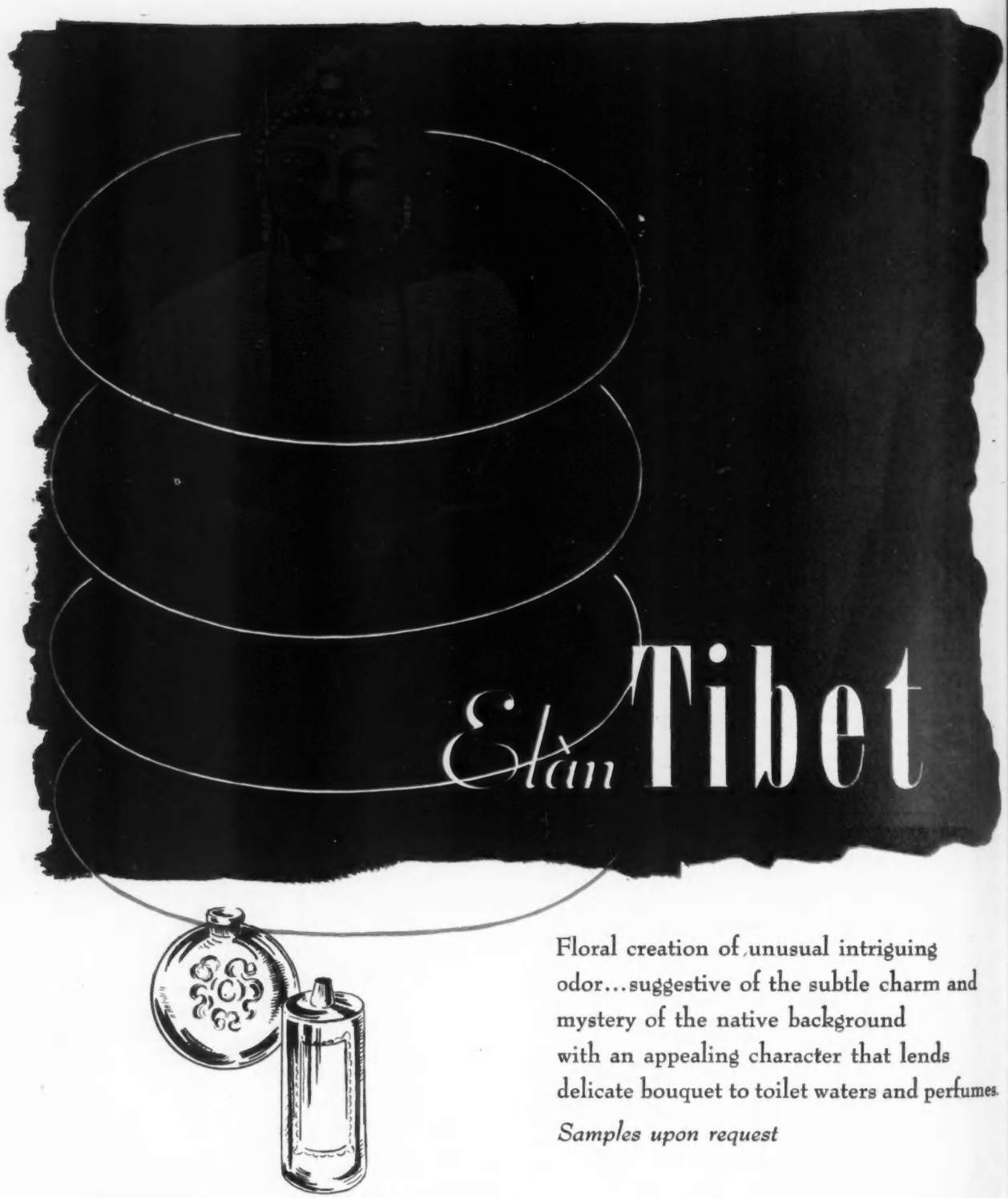

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SOAPS

The Current Soap and Glycerine Situation

Administration representatives meet with producers to discuss mutual problems . . . Seventy-five per cent of restrictions removed . . . Glycerine remains easy . . .

A SOAP and Glycerine Industry meeting, combined with the eighteenth annual meeting of the Association of American Soap and Glycerine Producers, Inc., was held on January 12th at the Waldorf-Astoria Hotel, New York, N. Y.

The morning was devoted to discussions on the part of the Potash Soap Division, under the direction of Russell Young, retiring chairman. Frank discussions on the part of W. A. McConlogue, Soap and Glycerine Chief, WFA, and Robert G. Deupree (not related to R. R. Deupree of Procter & Gamble Co.) who is head of the Drugs, Soaps and Cosmetic Section of OPA, on the supply situation, regulations, containers, etc., were the highlights of this particular meeting.

These talks were followed by an examination of the problems confronting this section of the soap and glycerine industry, and was participated in by all those present. Suggestions on ways of meeting these problems were analyzed, and committees were appointed for their more detailed study.

Following the nominating committee's report, Herbert Kranish was elected chairman, Clarence Weirich, vice-chairman, and Andrew Federline, who is assistant manager of the parent Soap Association, was re-elected secretary. The voting was unanimous. A more detailed report on this meeting appears elsewhere in this issue.

Luncheon got under way promptly at 12 o'clock, and was enjoyed by the largest attendance of any meeting in the history of the Association. It was estimated that 155 members and guests were present.

PRODUCERS' RESPONSIBILITIES

Officials of the War Food Administration and Office of Price Administration who attended the meeting thanked the industry for its success in maintaining the supply of its products under the handicaps of war economy. However, Lee Marshall, Director of Distribution for WFA, reminded the members that "with this tribute there is also thrust upon you a heavy responsibility. For the duration you have the responsibility of manufacturing and distributing large quantities of soap and related products not only to the civil population, but also the armed forces. Fighters on 56 fronts need large quantities of soap for a greater variety of uses. In the last war four or five fighting fronts were about the maximum at any one time.

Despite the large glycerine requirements, the production of glycerine has reached such proportions that all orders and regulations affecting its production were cancelled several months ago. As a matter of record, the total number of restrictive orders within the Fats and Oils Branch of the War Food Administration has been reduced about 75 per cent. And I can assure you that other restrictive orders will be cancelled just as soon as such action can safely be taken. Present indications point to no dwindling in the demand for explosives, nor can any shrinkage in the immediate demand for glycerine used in medicines be foreseen."

E. H. Little, president of Colgate-Palmolive-Peet Co., who was re-elected President of the Association, spoke in warm appreciation of the cooperation of the government representatives. "The tremendous quantities required by the Government, I am sure, have caused the largest production of soap that there has ever been in the history of this country. The big part of this increase, of course, has gone to the Government or to concerns that are doing business for the government, like the rubber and textile industries, and all of those other war industries that are using great quantities of soap for war production.

The records show that a certain amount of soap is needed to control the spread of disease and epidemics of one nature or another; that sickness and disease spread according to the per capita consumption of soap, and that with the lack of soap the death rate goes up. Studies of death rates in many countries of the world show this. When you have a small per capita consumption of soap your death rate, because of disease—and I suppose it gets back to the over-all hygiene situation—is much higher than when you have a greater per capita consumption of soap. So there is in this country a definite need for an adequate amount of soap."

COLLECTION OF WASTE FATS

An interesting highlight of Mr. Little's address was that the soap companies of this country spent last year approximately $1,500,000 to promote the collection of waste fats. An additional $1,500,000 was estimated to have been given without charge in the form of free radio time and space in paid advertisements toward the same effort. As a result of this, and other activities, homes in this country salvaged 170,000,000 pounds of waste fats. An additional 50-70,000,000 pounds was turned in by our armed forces.

Other government representatives who were present to give the Association members frank advice about the relationship of their industry to the war effort were: William H. Jasspon, Fats and Oils Chief; W. A. McConlogue, Soap and Glycerine Chief, both of WFA; and Robert G. Deupree, Head of Drugs, Soaps and Cosmetics Section of OPA. Mr. Little and Roscoe Edlund, manager of the Association, served jointly as presiding officers.

The place of honor on the program was given to an Army nurse, Lt. Ruth Anderson. Lt. Anderson, who returned recently from the Italian and North African campaigns, asked the entire industry's help in recruiting nurses. She emphasized how badly they were needed by our fighting men.

ESSENTIAL TO FIGHTING FRONTS

She reminded the soap and glycerine makers that their products are essential war materials. "In Italy, there was a water shortage, and we were warned repeatedly to spare the water. Never were we warned to save the soap. We did use that plentifully. We ran out of antiseptic solutions and we ran out of sterile water. We felt safe in just using plain soap and water, and that there was no danger of infection in using that."

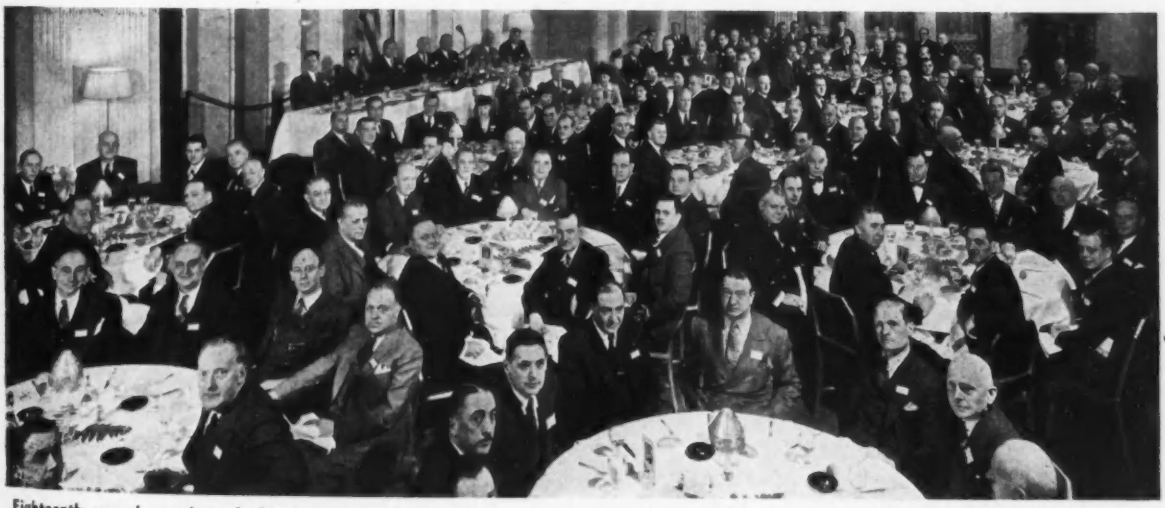
Mr. Jasspon, in describing the general policies of the War Food Administration, said: "Many of us here today remember, too vividly, I fear, the economic disaster which followed World War I, as a consequence of precipitate price depreciation of raw materials, especially fats and oils. I can well understand from my own experience in these days why each of us should strive to avert a recurrence of such an unprofitable performance. Caution is always a wise business attribute. But we have seen instances of excessive and unwarranted caution on several occasions within the past year, when temporary seasonal surpluses of certain raw materials materialized. It was our expressed conviction that we were in no danger of a real surplus, yet buyers were not always available to absorb offerings, except at concessions of one kind or another.

We realize the inherent threat to price stability which might arise at some future time from large government stockpiles hanging over the market. Therefore, our policy has been to own only the minimum quantities of such particular types of oils as are required by the military for essential war purposes, and for which no satisfactory substitutes are available. We have assured your industry also that the government has not acquired large stockpiles of your manufactured products as some had feared, and which might also at some time interfere with regular trade distribution."

WAR INDUSTRIES HAVE PRIORITY

Mr. Jasspon reminded his audience that military and other government requirements, including such essential industrial needs as those of the synthetic rubber program, are on the "must" list, and have prior claim on the industry's production.

Mr. McConlogue, in speaking of the soap supply situation, said: "It is no secret that military and government procurement of soap is now, and we expect it will continue, at a



Eighteenth annual meeting of the Association of the American Soap and Glycerine Producers, Inc., held at the Waldorf-Astoria, on January 12. It was estimated that 155 members and guests were present, the largest attendance in the history of the Association.

high rate, and in excess of a year ago. We have had difficulty in meeting these requirements. Under conditions of inadequate supply, we naturally continue to have trouble meeting some civilian demands. This is especially true in the case of yellow laundry bar soap and washing powder. At this point, I wish to express appreciation in behalf of the War Food Administration to the soap industry for its fine cooperation in distributing equitably the limited supply of civilian soap. Also, I have encountered a willingness on the part of this industry to provide all possible relief in the way of extra shipments of soap to distressed areas located by our Food Requirements Branch in its monthly survey of The Country's Soap Supply Situation."

Robert G. Deupree's short talk on regulations governing prices, and a listing of the personnel of his government agency, concluded the regular speakers program of the meeting.

In discussing the recent revocation of Commodity Practices Regulation No. 1, and the inclusion in MPR-391 of provisions which enable soap manufacturers to bring out new household soaps or cleansers, or to sell their old products in new territories, Mr. Deupree said: "In CPR 1, permission could not be granted to manufacture a new household soap or cleanser or sell an existing product in a new market area unless it could be shown that the manufacturer would be subject to substantial hardship unless such permission were granted. In transferring the provisions of CPR 1 to MPR-391 we have excluded this provision, as we feel it is no longer necessary or appropriate. Therefore, any manufacturer now has the opportunity, so far as OPA is concerned, to make a new household product or expand his market areas for old products. He must first file an application under MPR-391 and receive approval of maximum prices before offering the product for sale. A sample form of this application has been incorporated into the regulation for your use. We do, however, retain the right to disapprove any application if we find that the sale of the new product will lead to manipulative practices, or evasions of present regulations."

Mr. Edlund, in his closing remarks, emphasized the importance of the Association members' support of the organization on a pro rata basis, and urged that they participate in this manner.

RE-ELECTION OF OFFICERS

Other officers re-elected, in addition to Mr. Little, were N. S. Dahl, treasurer, H. F. Elberfeld, assistant-treasurer, and Roscoe C. Edlund, manager of the Association, secretary. The following vice-presidents were elected: F. A. Countway, E. A. Moss and F. H. Merrill. Two new directors were elected: H. F. Bernhard and C. E. Bertolet. Other directors for 1945 are: H. D. Banta, O. M. Burke, F. A. Countway, N. S. Dahl, R. R. Deupree, S. S. Fels, D. M. Flick, E. B. Hurlburt, E. H. Little, F. H. Merrill, E. A. Moss, G. A. Wrisley and C. F. Young.

Potash Soapmakers Expand Program

BESIDES electing a new slate of officers to serve in 1945 and listening to informative addresses by two Government officials on war-time regulation of potash soaps, the Potash Soap Division of the Soap Association at its third annual meeting, held in New York on January 12, voted to undertake three new activities to be carried on by the Division with the help of strong working committees.

NEW OFFICERS ELECTED

Herbert Kranich of the Kranich Soap Company became Chairman of the Division after serving two years as vice-chairman. C. L. Weirich of the C. B. Dolge Company succeeded him as vice-chairman. A. P. Federline, Assistant Manager of the Soap Association, was re-elected secretary. Russell Young of the Davies-Young Soap Company was paid high tribute, through resolution, for his services to the potash soap industry during the two years he had served as Division Chairman.

Report of third annual meeting of Potash Soap Division, Association of American Soap & Glycerine Producers, Inc.

The new activities, which will supplement the Division's continuing program of representing the potash soap industry at Washington and assisting individual companies with their war regulation problems, are: an annual census of raw materials consumed and product manufactured, by types of potash soap; job definitions for potash soap workers; and development of the best information possible on how to use potash soaps. These were suggested by the new Chairman and unanimously agreed to at the meeting, which authorized him to appoint working committees to get them under way as soon as practicable. They are described later in more detail.

GOVERNMENT OFFICERS SPEAK

The Government officials who spoke were W. A. McConlogue, Chief of the Soap and Glycerine Section of the War Food Administration, and Robert G. Deupree, Head of the Drugs, Soaps and Cosmetics Section of the Office of Price Administration (not related to the President of the Procter & Gamble Company). Their remarks were confined to war-time regulation of potash soaps. Later in the day both men, and Mrs. Marian Tate, who assists Mr. Deupree at OPA, were available for private consultation on company problems.

MR. McCONLOGUE'S MESSAGE

Very briefly, Mr. McConlogue pointed out that the War Food Administration has tried to go as far as practical in relieving potash soapmakers of the burden of war-time regulation. As examples, he cited the permitted use of 150,000 pounds of fats and oils without glycerine recovery when WFO-33 was in effect; the extra 10,000 pounds of fats and oils that even the smallest soapmaker is allowed to use over and above his regular quarterly quota; and the privilege which potash soapmakers have had of charging to quota only one-half of their use of foots from refining of domestic vegetable oils, or the fatty acids derived therefrom, whether distilled or not. WFA tries to limit to potash soaps the quantity of whole soybean oil allo-

cated to it for soapmaking. Potash soapmakers may apply for it on Form WFA-478 as required by Order WFO-29. The quantity allocated, however, is not large.

He also stated that 1945 coconut oil allocations probably would be no larger than 1944. No increase in imports is expected. Red oil supply is likely to remain tight until producers reestablish their high production rate. WFA does not plan to reinstate glycerine recovery. (References to certain statements are omitted on account of their confidential nature).

MR. DEUPREE'S MESSAGE

Mr. Deupree stated that except for shampoos and household soaps, price ceilings for potash soaps were determined under the General Maximum Price Regulation. It covers sales for industrial and government use. Household soaps and cleansers that are sold to individual consumers come under MPR-391. Shampoos, however, are controlled by three orders. When a manufacturer sells shampoo under his own name or label, GMPR applies to sales in bulk and MPR-393 applies to sales in consumer or professional size packages. When he sells shampoo for resale under another concern's name or label, RMPR-282 applies whether he sells it in finished packages or in bulk for bottling and resale by the purchaser.

Supplementary Regulation 15 permits OPA to raise ceilings on soaps that are controlled by GMPR. Adjustments are made primarily to the lowest-price seller of a particular product and then only where considerable hardship can be shown. While relief is not confined to a showing of hardship in over-all operations, the amount depends upon the degree to which operations are affected.

It is important to manufacturers as well as OPA that potash soap price lists be on file with OPA. Voluntary action by companies in providing their lists promptly will enable OPA to do a better job in establishing and controlling prices for other products as they enter the market. Price lists should be sent to Robert G. Deupree, care of Drugs, Soaps and Cosmetics Section, Office of Price Administration, Washington, D. C.

Discussion of the recommendation that a special potash soap census be taken annually by the Division to ascertain the quantity of raw materials used and the quantities, by types, of potash soaps produced, revealed both the need and a general desire among those present to have such data instantly available for use in discussing new war-time controls with government agencies and in planning individual company programs. The form to be used in gathering the data will be determined by the Potash Soap Census Committee which the Division Chairman was authorized to appoint. Charles Solly of the Harley Soap Company will serve as Chairman of the Committee.

REPORTS CONFIDENTIAL

No Committee member or Association officer or employee will ever see the confidential figures sent in by any company that seals the envelope containing its report. Company reports will be returned to the Division Secretary in sealed, numbered envelopes. He alone will have a key list showing the number assigned to each company. The list will be kept in a safety deposit box except when he uses it to check off the numbers of those who have sent in reports. When enough reports are in, he will turn the unopened envelopes over to an outside accountant, who will open them, tabulate the figures and destroy the reports. In this way, the Secretary will not see individual company figures, and the accountant will not know whose figures he tabulates. Only totals will be reported by the accountant to the Secretary, who will send them promptly to every company that reported under each product classification.

PRODUCT USE STANDARDIZATION

Preparation of adequate directions for use of potash soaps was thought to be an important service for the Division to render to all potash soapmakers and consumers. The tentative plan is for companies to send to the Division office all directions they give consumers for use of their products. These will be analyzed by the Potash Soap Publicity Committee, which will prepare simple but adequate directions for every type of product. Every member of the industry and the trade press will receive copies of the suggested directions. It is hoped that by frequent repetition of the same directions for each type of product, consumers will get better service from potash soaps and will not turn so readily to other types of detergents. The consensus was that a substantial percentage of potash soap users are lost every year because they either do not have, or fail to read and follow, simple directions for use of the product. No attempt will be made by the Committee to inquire into product formulation. The Chairman is Melvin Fuld, a copartner of Fuld Brothers.

JOB DESCRIPTIONS

Job classifications will be set up by the Division for all jobs in potash soap manufacture that are not described adequately in the "Dictionary of Occupational Titles" now used by the U. S. Employment Service, and other government agencies concerned with manpower controls. The Committee handling this work will be known as the Job Classification Committee. The former Chairman of the Division, Russell Young, will serve as its chairman.

TECHNICAL COMMITTEE

Still another committee which the new Executive Committee will be asked to approve, will be known as the Potash Soap Technical Committee. Its purpose will be to bring together the principal technical men engaged in potash soap manufacture to discuss mutual problems. The new Chairman had planned to discuss and ask for a vote on it at the Division meeting, but the program was so crowded that there was not time to bring it up before adjournment for the Soap and Glycerine Industry meeting, which convened promptly at noon.

EXECUTIVE COMMITTEE NAMED

The Executive Committee which has been named to share with the new officers and special committees the responsibility of seeing that the Division's enlarged program is carried through successfully, includes the following, in addition to the elected officers: C. E. Bertolet, M. Fuld, T. M. Galvin, L. Hockwald, Leo. G. Nunes, M. P. O'Connell, E. A. Olds, Jr., L. J. Oppenheimer, W. F. Pollnow, G. L. Simmonds, C. B. Solly, J. A. Walsh, L. Webb, Jr., C. L. Weirich, R. H. Young.

FLAVORS

Color Affects One's Ability to Judge Flavor

How and why the food chemist uses color to enhance his products . . . There are eighteen so-called certified colors available for food use

by EILEEN NEUMANN
Home Economist, Virginia Dare Extract Company

GOLDEN oranges, lemon yellows, cherry reds, grape purples, crisp greens and vibrant blues, are the colors that the food chemist has to enhance his products.

Color is to the eye what flavor is to the palate and aroma is to the sense of smell. Well are the manufacturers aware that only colorful, flavorful foods will mean satisfaction and repeating sales. Dull, drab, unpleasant looking products are not aesthetically pleasing.

We place many meanings on the colors that we see and use everyday. Red means danger or stop; green means proceed; black and white stripes mean beware.

CERTIFIED COLORS DEFINED

Psychologically colors affect us. Reds, yellows and oranges are warm colors and stimulate activity, congeniality and laughter. The cool colors—blue and green are quieting in effect and have a sobering influence. For that reason used in combination with the warm colors they make for a harmonious, colorful, vibrant, yet restful color effect.

What are the colors used by the food chemist? There are eighteen certified colors for food use. These are so-called artificial colors. They are called certified because samples from each lot of color whether it be dry, liquid or paste, have been sent to the Federal Security Agency for analysis. The certification means that the colors are harmless for the use for which they have been certified. A lot number assigned by the Agency appears on the label of the container attesting to its certification and is the consumer's visible protection.

Today certified colors are so much a part of manufacturing that it is hard to realize that the first aniline or coal tar color was discovered in 1856, by an English chemist, William Henry Perkin.

This famous chemist was trying to synthesize quinine, a problem which has only recently been solved, when he found that he had a black tarry substance. What had happened to the pure white crystals he had hoped to obtain? Obviously he had made a mistake and would have to repeat his work. After repeated experiments he found that he had made no mistake but had obtained a dye as his end product.

WIDESPREAD USE OF COLOR

After much preliminary work he discovered that his new dye was far superior to the dyes used in the textile industry of that day and he persuaded his father and brother to manufacture the dye on a commercial scale. In 1865 the firm of Perkin & Sons was formed after having been granted a patent for this manufacturing process. Perkin solved one problem only to find that he was confronted with another. The textile manufacturers would not use his dye because they did not understand how it worked. Because he was so thoroughly convinced of its superiority he went out to the textile manufacturers and showed them how to use this beautiful purple dye. The color became very popular. Queen Victoria had a dress made of the color and the first penny postage stamp was printed with it. The widespread use of the color by then called Mauve, led to the designating of that period

of time as the "Mauve Era."

The yield of the dye—¼ oz. of color from 100 lbs. of coal tar. This of course made the color expensive. Fortunately, better manufacturing methods and more widespread use of the colors bring the price today within the range of every manufacturer.

Today coal tar colors can be made as a dry powder, as a liquid or as a paste. The two former are the most popular because they are easier to use.

TYPES OF COLORS

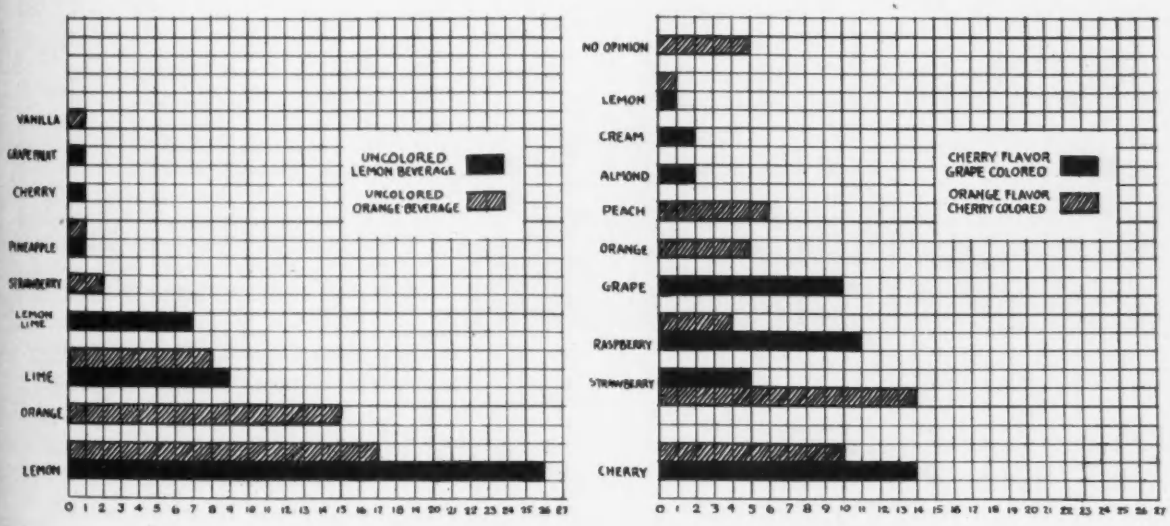
Dry colors come in sealed containers with the certification number plainly marked on the labels. Dry colors must be stored away from moisture so that the color will not absorb moisture and become lumpy. In using dry colors care should be taken to dissolve only the amount which will stay in solution after the solution has cooled. The easiest and must efficient way to dissolve the color is to dissolve the specified amount in a small quantity of water. Care should be taken to see that there are no lumps of color left undissolved. Add more water and stir until the color is evenly spread throughout the solution. Strain into the product.

Liquid colors are easy to handle and accurate to use but several precautions should be noted. Pouring only the amount needed will prevent contamination. The solution should be stored away from light and heat. Contamination of molds, dust and bacteria should also be avoided. Water solutions of dry colors are usually preserved with alcohol, glycerine or sodium benzoate. Ten per cent by volume of alcohol, 25 per cent glycerine or .1 per cent sodium benzoate with citric acid have proven to be satisfactory preservatives.

Some of the colors most frequently used are: Certified amaranth is a purplish red and can be used as raspberry or cherry color. In combination with yellow it can be made to resemble strawberry color, and with yellow and blue it makes a satisfactory purple shade. Approximately 18 ozs. dry color will dissolve in 1 gallon of water at 70 deg. F.

Certified brilliant blue is a greenish blue and is usually used with yellow to make lime and lemon-lime shades, with amaranth for purple. About 25 ozs. of color will dissolve in 1 gallon of water at 70 deg. F. Certified ponceau 3 R is a cherry red color. This color is sometimes used in combination with yellow to make orange but is not as popular as amaranth. Approximately 15 ozs. of color will dissolve in 1 gallon of water at 70 deg. F. Certified sunset yellow is a yellow orange which is sometimes used with yellow to make a very yellow orange or with red to make a red orange. About 23 ozs. of color will dissolve in 1 gallon of water at 70 deg. F. Certified tartrazine is a lemon yellow color and is used with blue to simulate lime shades. About 17 ozs. of color wll dissolve in a gallon of water at 70 deg. F.

Does color really affect your ability to judge the flavor of a beverage? Recently an experiment was conducted on a group of 45 persons. The object was to see if the color or lack of it would influence the ability of the persons to name some carbonated beverages. Two of the samples were left uncolored. They were lemon and orange flavored respectively. The second set of samples were falsely colored. One orange flavored beverage was cherry colored and one cherry flavored beverage, grape colored.



This graph shows the number of errors made in flavor identification which were caused by false coloring, or lack of coloring in beverages.

No. 1A is uncolored lemon beverage. The results were as follows:

Lemon flavor	26	Cherry flavor	1
Lime flavor	9	Grapefruit flavor	1
Lemon-lime flavor	7	Pineapple flavor	1

No. 1B is uncolored orange beverage. The results were as follows:

Lemon flavor	18	Strawberry flavor	2
Orange flavor	15	Pineapple flavor	1
Lime flavor	8	Vanilla flavor	1

No. 2A is a cherry flavored beverage, grape colored. The results were as follows:

Cherry flavor	14	Almond flavor	2
Raspberry flavor	11	Cream flavor	2
Grape flavor	10	Lemon flavor	1
Strawberry flavor	5		

No. 2B is an orange flavored beverage, colored red. The results were as follows:

Strawberry flavor	14	Raspberry flavor	4
Cherry flavor	10	Lemon flavor	1
Orange flavor	5	Peach flavor	6

Because of the small number of persons tested, the results are not conclusive but indicate the general trend of importance of color.

It is the color of a beverage that gives you your first clue as to the possibility of the flavor, the aroma is the second and finally the flavor is the third clue.

Leslie Brooks featured in Columbia's technicolor production "*Tonight and Every Night*"

Beauty

DOES IT . . . Every Time

ON THE SCREEN the alluring beauty of Leslie Brooks draws audiences, increases "box office."

OVER THE COUNTER the eye-stopping beauty of an artfully designed package draws buyers, increases sales.

The BEAUTY *of this Lady Esther package helps make sales*—AT THE POINT OF SALE

THE 5 ESSENTIALS OF A SELLING PACKAGE

1 It must be practical, production-planned, economical to manufacture, easy to fill or pack.

2 It must fully protect and conveniently dispense the product.

3 It must be easy to handle, stack, display.

4 It must proclaim the quality and identity of your product.

5 It must be notably "good looking," memorable, ATTRACTIVE!

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SET-UP PAPER BOXES • FIBRE CANS • TRANSPARENT PACKAGES

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SEVENTY-NINE years of packaging experience has taught Ritchie that—with all the complex, practical factors involved in the production of a package—it is always possible *and extremely profitable to add beauty!*

WAY TO A BETTER SELLING PACKAGE

The Ritchie way integrates art and artisanship—to give you a better selling package at a low unit cost. A package that quickly, unmistakably identifies, fully protects and conveniently dispenses your product. A practical, production-planned package—easy to fill or pack, easy to handle, to stack and display—but *above all* designed for eye-appeal, for quality-impression, for *beauty that sells!*

Candy Sales Up

Manufacturers of confectionery and competitive chocolate products reported sales up 9 per cent for October 1944 over October 1943, according to a report by the Bureau of the Census. Their sales in October were 12 per cent higher than those for September 1944, and for the first 10 months of 1944 dollar volume stood 14 per cent ahead of the volume for the like period of 1943. This data is based upon reports from 219 manufacturers throughout the country.

A sales gain of 9 per cent was registered for manufacturer-retailers for October 1944 compared with October 1943; sales were down 11 per cent for manufacturers of chocolate products competitive with confectionery.

Alcohol Drawback

Section 22.30, Customs Regulations of 1943 (19 CFR, Cum. Supp., 22.30) is hereby amended as follows: 22.30 Collector's statement of drawback due. (a) When the drawback claim has been completed by the filing of the entry, bills of lading, etc., as required by the regulations in this part, any required lading certificate has been produced, and clearance of the exporting conveyance has been established by the records of clearance in the case of direct exportation or by a certificate when the merchandise was exported at another port, the collector shall proceed to ascertain the amount of the drawback due by reference to the certificate of manufacture and the drawback rate under which the drawback claim is allowable.

(b) If the affidavit is required by section 22.27 (d) shows that claim has been, or will be made for the domestic drawback referred to in that section, the allowance of drawback under the provisions of section 313 (d), Tariff Act of 1930, as amended, shall be limited to the difference between the amount of tax paid and the amount of domestic drawback claimed. If the affidavit shows that no claim has been, or will be made by the manufacturer for the domestic drawback, the collector shall suspend liquidation of the entry and report the facts to the Commissioner of Internal Revenue (Alcohol Tax Unit), Washington, D. C., for advice whether the drawback shall be allowed of the full amount of the tax paid on the alcohol used. The Collector shall be governed by the advice received from the Commissioner of Internal Revenue.

(c) The collector shall then prepare a certificate on customs form 4539, showing in addition to the information called for therein, the Bureau of Internal Revenue certificate number applicable to the alcohol used. The certificate on customs Form 4539, together with a written request for payment of the amount found due, signed by the claimant and addressed to the Comptroller General of the United States, shall be transmitted by the collector to the Commissioner of Internal Revenue (Alcohol Tax Unit), who will forward it to the Comptroller General of the United States for payment.

PROCEDURE OUTLINED

(a) In the allowance of the drawback of internal-revenue tax under the preceding section, the regulations in this part relating to the allowance of drawback on articles manufactured with the use of imported merchandise shall be allowed so far as applicable and except as otherwise specified in this and following sections.

(b) The notice of intent shall be filed on customs Form 7511. When it covers duty-paid imported merchandise, in addition to the tax-paid alcohol, two sets of drawback entries shall be filed, one set for customs drawback and the other for internal-revenue drawback.

(c) The following forms shall be used in lieu of the corresponding forms used in the case of articles manufactured with the use of imported merchandise:

Drawback entry, customs Form 7579.

Drawback entry and certificate of manufacture, customs Form 7583.

Certificate of manufacture and delivery, customs Form 7585.

Certificate of delivery of tax-paid alcohol, customs Form 7545.

The above forms can be secured from your local customs office.

Clove Harvest Poor

The Zanzibar clove situation, as reported in the Zanzibar Clove Growers' Association Market Review for the second quarter of 1944, was that the harvest was not expected to be large.

During the quarter April 1 to June 30 supplies amounted to about 2,000 short tons. For the seasonal year July 1943 to June 1944, supplies amounted to 18,000 short tons, and exports came to 6,500 tons. Clove-oil production was not sufficient to satisfy current demands.

Shortages in Strawberries, Raspberries and Cherries

FLAVOR manufacturers faced with the present shortages in fruit will find a solution of their problems with

Imitation Strawberry No. 21

Imitation Raspberry No. 75

Imitation Cherry No. 105

These useful products may be used to augment natural fruit flavors, to create greater strength or to stretch the effectiveness of natural flavor, or—they may be used with success just as they are without any additions.

Write for working samples and full information.

Norda

ESSENTIAL OIL AND CHEMICAL COMPANY, INCORPORATED

NEW YORK OFFICE: 601 WEST 26th STREET
CHICAGO: 325 W. HURON STREET
ST. LOUIS: 1123 WASHINGTON AVENUE
ST. PAUL: 253 E. 4th STREET
LOS ANGELES: 2800 E. 11th STREET
CANADA: 119 ADELAIDE STREET, W. TORONTO
HAVANA, CUBA: AMARGURA 160

NEW PRODUCTS AND PROCESSES

New Synthetic Organic Detergent

A new synthetic organic detergent of the substituted sodium alkyl sulfonate type has been announced by the Solvay Process Co., 40 Rector St., New York, N. Y. The manufacturers state that it is derived from a petroleum base and contains 35 per cent of organic material. The new NS detergent as it is named should be of interest to those requiring high water solubility combined with good detergent, emulsifying and wetting properties. Further information will be supplied on request by the Product Development Section of the company at the above address.

Industrial Microbiology Service

L. H. James, Ph.D., professor of bacteriology and head of that department, the University of Maryland, and director of numerous research projects, has opened a laboratory and has established a consulting service in industrial microbiology at 189 W. Madison St., Chicago 2, Ill. The laboratory will specialize in fermentations, microbial enzymes, disinfectants, antiseptics, etc.

Cold Storage Warehouse Facilities

Cold storage warehouse facilities of the Federal Cold Storage Co. in 14 cities in the country's largest buying centers are offered to manufacturers in need of such service. Full details about the service will be sent to anyone interested.

New Sweeping Compound

A new grade of Kew Bee Kut sweeping compound which is said to magnetize dust while sweeping, preventing it from flying around fixtures, shelves, desks and equipment is offered by the National Sawdust Co., Inc., 69 N. Sixth St., Brooklyn, N. Y. It is further claimed that it loosens dirt that has adhered to floors and that it leaves a clean, pleasant odor. It is offered in red or green colors and samples will be sent on request for inspection. The company also announces a special Red Ruby Ray sweeping compound for linoleum, terrazo and rubberized floors which is claimed to loosen dirt and keep dust down and leave a polished and waxed floor.

Water-resistant Adhesives

Four newly improved water-resistant adhesives, designed for overseas packaging have been announced by Paisley Products, Inc. Each adhesive has individual characteristics for particular operations in the final sealing of waterproof bags, liners, etc.

These adhesives are of the emulsion type. In addition to being noninflammable and free from objectionable odors, according to the manufacturers, they permit fast sealing as they can be water thinned to spread evenly and without brush drag. The makers state that when completely dry they are resistant to extremes of heat, cold, humidity, and immersion with a safe margin over the usual specifications.

An Adhesive Problem Data Sheet and Technical Service Bulletins are available to war contractors upon request.

New Laboratory Filter

A new laboratory filter, manufactured especially for laboratory and small production operations, has been put on the market by the Ertel Engineering Corp.

This pyrogen and bacterial retentive unit is constructed of bronze plated materials or entirely from stainless steel. It is now available in sizes 4 inches and 8 inches in diameter. Its makers claim that the larger unit will filter 1 liter of aqueous solution in 15 minutes at 10 pounds pressure.

This filter uses counter pressures to force the liquid from the pressure flask to the filter. Its makers state that a minimum of parts makes it easy to clean and simple to assemble. Literature is available for more detailed description.

Consulting Chemical Service

Dr. C. William Lenth, affiliated for many years with the Miner Laboratories and until recently with the Fats and Oils Branch of the War Food Administration announces a consulting service on chemical problems. The service includes the organization, review and direction of research programs and assistance in patent matters. Offices and laboratory are maintained in Chicago.

Catalogs

Givaudan-Delawanna, Inc., New York, N. Y., has published a booklet on new disinfectants. Written by Dr. Arthur R. Cade, the book describes two new phenolic compounds which have been synthesized, and contains a critique of methods of testing phenol coefficients. Copies are available without charge.

The Emulsol Corp., Chicago, Ill., has brought out a new catalog on surface-active compounds. It contains excerpts from the U. S. Food, Drug and Cosmetic Act, and a discussion of emulsions, emulsifiers and emulsifications. Products described are chiefly for use in the household, pest control, cosmetic, pharmaceutical and food processing, cleaning and laundry fields.

New price catalogs have been issued by: Aromatic Products, Inc., 15 East 30 St., New York, N. Y.; Dodge & Olcott Co., 180 Varick St., New York, N. Y.; and Neumann-Buslee & Wolfe, Chicago, Ill. Copies may be obtained by writing the companies listed.

The Bump Pump Co., has issued a 104-page catalog describing the Bump Pump principle of operation, range of sizes in both industrial and sanitary pumps. It contains operating and construction features, dimension and installation diagrams, horsepower charts, and friction loss tables. It is extensively illustrated with halftone reproductions of the pumps.

by ARNOLD KRUCKMAN

ALCOHOL is dwindling in supply. The quantity allocated for January—one-third of the volume allocated the last quarter of 1944—is not quite the amount expected. In 1944, particularly during the last quarter, the toiletries and cosmetic industry received from 70 per cent to 80 per cent of its base supply; the supply in January was between 60 per cent and 70 per cent of the base, and in February it will be less. Until there is a very sharp change in the fortunes of war in Europe, the supply of alcohol will continue to diminish. The production of synthetic rubber, vastly stepped up, is taking more alcohol every week. The military and the lend-lease people are taking more; since the first of the year the total take for synthetic rubber, military, and lend-lease, has increased over 25 per cent and the need constantly increases. Government people would like to produce more alcohol from materials such as sugar and molasses, but they do not feel it is safe to further strip the sugar supply. Isopropyl alcohol has been entirely eliminated from cosmetic and toiletries uses. Apparently the folk who made arrangements to obtain some of the Puerto Rico alcohol were very wise.

SHRINKAGE OF FATS AND OILS

It is anticipated lanolin will continue to be supplied at the rate of 150,000 pounds every two months. The next allocation should be for March and April. Stearic acid is definitely critical in supply, and is expected to become less available. This obviously spells a shrinkage in the supply of fats and oils. In addition to a greater need for Army requirements, Department of Agriculture reports there will be a decidedly smaller production of fats and oils this year. Domestic production will be approximately 2,000,000,000 pounds off, and imports will be less. It is anticipated something like 1,000,000,000 pounds will be shipped to the liberated areas of Europe as quickly as shipping facilities may be had. The Department of Commerce reports the Philippine coconut oil, whose loss was such a serious jolt to American manufacturers, apparently may be expected in the not remote future, if the American advance in the Philippines continues. The Islands of Leyte and Samar produce from 11 per cent to 15 per cent of the coconut oil copra; the crushing facilities are located in Manila. It is likely they have been damaged by the Japanese. For this reason we will probably receive copra in place of coconut oil for some time ahead. Normally we import 800,000,000 pounds oil-fat from the Philippines. The chief difficulty is expected to be cargo space.

PACKAGING SUPPLIES REDUCED

Paper and all paper products are rapidly being reduced to absolute essentials. Boxes for packaging sets will be low in supply, and will be stripped of everything except what is necessary. There is, however, no change in the allocation of tin for packaging. A release issued late in January by WPB was generally misunderstood and caused considerable dismay. It sounded as though all authorizations for the use of tin had been wiped out to conserve the diminishing stockpile. It turns out, however, the Order does not touch the toiletries or cosmetic industry at all. It was purposed to shut off the black market operations in the manufacture of jewelry and similar products. Products of this kind may not be sold after March 1. The present use of tin in tubes and other packages for toiletries and cosmetics is undisturbed. Our friend Elmer Tysdal, Chief, Cosmetics and Toiletries Section, WPB, has made quite clear that toothpaste, lather-type shaving cream, mascara, and depilatories, in the opinion of the Government, have a reasonable claim for priority in the use of materials utilized for collapsible tubes. It is, however, the judgment of the WPB people that all other items of toiletries and cosmetics that can be packed in other containers should be put up in anything but tubes. Lead is very short and is diminishing in supply. Amendment to M-115, issued January 15, 1945, limits lead for collapsible tubes—other than military—for the first quarter of 1945 to 15 per cent of the amount used in the first six months of 1944. This cuts the supply in half. The only end use control is the limitation upon the use of tin for various purposes. Tube manufacturers may distribute their products as they wish. WPB is not quite sure about the present determinations in regard to the relative importance of end-use requirement of various containers using lead and tin as well as other materials. A survey is under way to obtain exact information. The survey particularly stresses the rela-

tive importance of the uses of collapsible tubes. It is anticipated the results of the survey may spell more precisely the future allocation of materials for tubes and similar containers. The report should be available in February.

WPB PRAISES CHEMICAL INDUSTRY

Two pounds of caffeine may be obtained by any commercial operator without red tape, under the small order exemption. The Order was issued in connection with the revocation of Conservation Order M-222 and with the incorporation of its terms and controls to Schedule 89 of Order M-300. OPA, in Amendment 7 to MPR No. 392, provides that producers or distributors of packaged cosmetics, coming under common ownership or control, are permitted to apply for adjustment of ceiling prices for sales to other combinations, providing the buying distributors agree to absorb the increase in prices. Hitherto the regulation applied only to single exclusive distributors selling to single distributors who resold. From Texas the Government people in OPA and WPB, as well as in WFA, have received word that the essential oil crop has expanded markedly. Reports are expected in regard to details about kind and quantities. The Chemical Bureau of WPB, which is notable for its avoidance of public notice of any kind, recently startled us by issuing a highly detailed release praising the American chemical and allied products industry for achieving the highest production level in history. In 1939 the production had a value of $3,700,000,000; in 1944 it jumped two and a quarter times to the total of $8,300,000,000. The report devotes a special section to cosmetics. It states the value of cosmetic production jumped from $219,000,000 in 1939, to $408,000,000 in 1944. It especially praises the technical ingenuity of the industry in devising artful methods of substitution for critical materials. The report attributes the rapidly rising sales of cosmetics to higher wartime incomes and to the demand for cosmetics by women in war industries and war services. Almost simultaneously the Food and Drug Administration made a report about its effort to stop economic cheating, and mentioned the fight against the marketing of cosmetics containing dyes injurious to the skin. Apparently the Food and Drug Administration particularly is striving to enforce prohibition of "substantial substitutions and dangerous departures from the normal in cosmetic supplies." Especial mention was made about the discovery that some manufacturers are illegally using colors containing dyes which are not certified as safe for use, because of their dangerous properties. Investigators also found injurious ingredients in hair preparations and cleansing creams and in cosmetics made for eyelashes and eyebrows. One hair lacquer, made both in liquid form and in cloth pads, impregnated with the liquid, has caused severe dermatitis. The manufacturers, unable to secure shellac, due to critical short supply, substituted a synthetic gum. Government seized the stocks of the lacquer and forced the manufacturer to recall all the product from retailers. Government also seized a lash and brow tint containing paraphenylenediamene, considered unusually dangerous. Large quantities of "anti-grey hair" vitamins were seized because they did not prevent grey hair nor restore grey hair to its original color. Incidentally, Office of Defense Transportation reported that among 75 voluntary convention cancellations there were the International Beauty Shop Owners Convention in New York on March 19, and the National Beauty and Barber Manufacturers Association annual convention in New York in September.

INDIA EXPORTS ESSENTIAL OILS

From the Department of Commerce, in the absence of Lester Barber, Marian Hall Drake of the Industrial Projects Unit, makes the comment that India still exports many valuable essential oils, particularly sandalwood, lemongrass, palarosa and cardamon. Miss Hall notes that India apparently still produces its essential oils and perfumes by ancient methods. She quotes chapter and verse from history for the assertion that Queen Elizabeth always preferably used Indian aromatics as her perfumes, and that the tragic Mary, Queen of Scots, ordered her baths "delightfully perfumed with Indian odors." In India, the State of Mysore annually produces over 200,000 pounds sandalwood oil, sending abroad all but 80,000 pounds. In 1941 we bought 35,000 pounds of the exported oil; most of the balance went to the United Kingdom. Miss Hall reports that sandalwood oil is used to secure exquisite perfume effects of sweet, woody fragrances, blending with patchouli, vetivert, geranium, musk, and similar perfume bases. Miss Hall also tells that apparently during the first dynasty of ancient Egypt they used jasmine for fragrance, together with almond oil from Syria, and origanum from Palestine. In fact the Palestinians probably have a longer continuous history in making perfumes than any ancient people still in existence. The sweet scents of old Araby include opopana oil also known as Bissobal myrrh, and oil of olibanum, all used in rare French combinations today. She urges upon our attention the rose oil of Turkey as fully as useful as the rose oil of Bulgaria.

BARBER IN SOUTHERN FRANCE

It is in the range of possibilities that Lester Barber, assistant chief of the Drugs and Pharmaceutical Section of the Bureau of Foreign and Domestic Commerce, now in France making a survey of the stock of essential oils available, may get down as far as Bulgaria and Turkey. At this writing Mr. Barber is in Southern France, in the Grasse country. The State Department may soon have another report from him. The exact whereabouts of Gerald M. Strauss, agent for the U. S. Commercial Company in France, does not seem to be known even to his employers and his own office. He left Washington three weeks ago, and has not been heard from since he was in New York about a fortnight ago. There is always much hush-hush and mysterious suppression of elemental facts in connection with FEA wayfarers and those who journey on Army planes. Strauss, whose relation to those who use his services in buying essential oils in France is rather misty, will be remembered by some people in the industry for his connection with Tokalan in New York some eight or ten years ago. He represented the Tokalan firm, which had a dispensary of its products on Fifth Avenue. Previously he had been an employee of the House in Paris. The Tokalan firm is reported to be one of those French institutions which do not attempt to market its wares beyond

France, except to make them directly available in a few world centers to those customers who have been clients in France. The Strauss expedition to France, as agent to acquire essential oils for American clients, was finally announced formally by FEA in one of its rare releases. The announcement does not make clear whether Strauss is agent for the individual buyer or acts as buyer on behalf of FEA or USCC. The contract the prospective buyer is asked to make with USCC requires that the American buyer place 110 per cent of the maximum purchasing price in escrow and leave it there nine months. The buyer designates the material he desires and the names of the firms from whom he wishes to obtain the essential oil, but the contract does not guarantee that the prospective buyers will receive what he orders. Under the contract Mr. Strauss buys the essential oil in France, and the USCC re-sells some essential oil to the buyer in the United States. Obviously the prospective buyer apparently has no claim against the Government if the material he receives is imperfect, or does not fulfill specifications. A broker must accept such responsibility. There has also been considerable speculation about the way the FEA bypasses the Reconversion Law, Public 458, which requires that any limited material acquired or controlled by Government for distribution among members of the industrial economy must be allocated so that it may be available to every member of the industry, whether the member of the industry has a historic background or has started business yesterday. It is reported in Washington that only a limited number of firms in the industry have contracted to use the Strauss services. Copies of the contract may be had by applying to C. J. Horney, General Commodities Division, U. S. Commercial Company, Temporary T Building, Washington 25, D. C. In passing, it is timely to mention that Oscar S. Cox, of Portland, Maine, lawyer, has been appointed deputy administrator of FEA. He has specialized in libel, banking and litigation law practice. He has been one of the corporation counsels of the City of New York, was an assistant general counsel in the U. S. Treasury, drafted the lend-lease act and nursed it through Congress, and until recently was general counsel for FEA. He is succeeded as general counsel by Alfred E. Davidson, Harvard and Columbia Law Schools, who passed his Washington novitiate in the Department of Labor and the Wage and Hour Division. He also was a member of the staff of the Corporation Counsel of the City of New York.

Secretary of Labor Perkins reported late in January that there has been an advance of prices in beauty shops throughout the country. She estimates the general over-all rise from mid-November to mid-December averaged 1 per cent. It also is interesting to note that the War Labor Board ruled in connection with a labor complaint from employees of a firm making materials used in connection with cosmetics and toiletries that profits or financial embarrassments must not be considered in determining wage rates during wartime; that such considerations are "clearly out of place in wartime, when labor relations are controlled, not in the interest of either the employers or the employees, but in the interest of the national war effort."

WPB COSMETICS SECTION MEETS

Under the chairmanship of Chief Elmer Tysdal of the WPB Cosmetics and Toiletries Section, meetings recently were held of the Dentifrice Industry Advisory Committee and the Cosmetics and Toiletries Industry Advisory Committee. Present at the meeting of the Dentifrice Industry Advisory Committee were: James Hill, Jr., R. L. Watkins Company; H. F. Brownell, McKesson & Robbins; Edward W. Love, Bristol-Myers Co.; F. F. Berg, E. R. Squibb & Son; J. W. Kane, Iodent Chemical Co.; Walter L. Lingle, Jr., Procter & Gamble; Joel Y. Lund, Lambert Pharmacal Co.; Henry F. Woulfe, Pepsodent Co. At the Toiletries and Cosmetic Industry Advisory Committee meeting were present: B. F. Breslauer, A. Breslauer Co.; Joseph Danilek, Cosmetique Tussy Lesquendieu; Paul H. Douglas, Bourjois, Inc.; Ralph L. Evans, Ralph L. Evans Associates; Davis Factor, Max Factor Co.; Jule Gordon, Nestle-LeMur Co.; J. D. Nelson, Andrew Jergens Co.; Manning O'Connor, Colgate-Palmolive-Peet Co.; John H. Wallace, Jr., Carter Products, Inc.; Northam Warren, Northam Warren Corp.; J. S. Wiedhopf, Parfums Ciro, Inc.

The President's recent budget introduces for the first time the suggestion that the Government has a formal interest in the control of the nation's budget. The Federal budget covers the income and the outgo to run the Government; the budget of the Nation concerns our income and expenses as individuals and firms. The combination is called "compensatory economy." It is apparently our old friend, "managed economy" looked upon from another angle. It concerns the money or the surplus we save and accumulate in banks or elsewhere. Current thought in Washington and elsewhere calls this saved or impounded surplus "leakage." This means it has "leaked" out of the circulatory system of the general economy, and this theory must be forced back into the bloodstream of the economy to maintain the 60,000,000 jobs mentioned by Henry Wallace, and to prevent depressions or other slowdowns. The "leakage" is to be put to work through banks, and by subsidies to farmers, business, and by spending it on projects such as the 15 or 20 additional TVAs and other public works. The President suggests it might be used to expand opportunities for education, to feed people better, to enlarge the opportunities for Social Security application, and to make people more healthy. It was first bruited in the reports of the Temporary National Economic Committee—TNEC—and the National Resources Planning Board. Recently it was actively brought into Congress in the bill to promote "National Production and Full Employment," introduced by Senators Murray, Montana; Wagner, New York; Thomas, Utah; and O'Mahoney, Wyoming, all New Dealers. It would set up a planning bureau in the White House to operate the program. It would create another Budget Bureau to plan, program, and budget the resources of persons and corporations for investment to employ the "leakage." These investments would logically determine the direction of our business and industry and our social life. The bill itself starts by declaring it is the policy of the United States to "Foster free competitive enterprise and the investment of private capital."

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U.S.I. CHEMICAL NEWS

February ★ A Monthly Series for Chemists and Executives of the Solvents and Chemical Consuming Industries ★ 1945

Millions of Yards of Treated Duck Produced for Army

Expanded Tentage Program Takes Large Quantities of U.S.I. Resin

Early in the war, the Army Quartermaster Corps adopted a new and greatly improved type of treated canvas which is now adding much to the protection of army personnel and equipment against the elements, as well as the enemy. The program of development and evaluation has been long and arduous, requiring the testing of innumerable samples by laboratory methods and by exposure for long periods to varying climatic conditions. The results have been remarkable, and the properties towards which the Quartermaster Corps aimed have, in a large measure, been achieved.

Canvas, treated by this new method, has been greatly improved in durability by reducing the deleterious effects of sun and moisture and by incorporation of mildew proofing agents. The canvas is also practically impervious to rain. These characteristics are highly desirable when we consider that our armies are stationed throughout the world, in all types of climate.

Fire Resistance

The new treatment also imparts resistance to fire. The fabric is not completely fire-proof, but the compound employed effectively retards free burning. Fire hazard is thereby minimized as a further protection to personnel and equipment.

Camouflaging of tentage and tarpaulins is also vital. This is done by incorporating durable, high-strength coloring pigments in the coating compound, and thus imparting the desired color to the treated fabric.

The army is, today, purchasing enormous quantities of cotton duck and other fabrics,

(*Continued on next page*)

Treated Sheep Skins Resemble Finest Furs

Using existing machinery common in the fur industry, lamb and sheep pelts may be treated so as to resemble beaver, nutria, seal, or other similar furs according to claims made in a recent patent.

Though variants of the process are given, essentially it consists of applying to the skin a solution of nitric acid and denatured alcohol. After drying, the skins are passed through an "electrifying" machine in which they are heated, brushed, and combed. The pelts emerge with straight, lustrous, yellow filaments which will not re-kink upon subsequent wetting.

The final step is dying to the color native to the fur to be imitated.

Insoluble Alkyd Fractions Produce Superior Films

The results of a series of tests seem to demonstrate that films formed from alcohol-insoluble fractions of alkyd resins dry more rapidly, are harder and at the same time less brittle than the original alkyds.

Lower alcohols, such as ethanol, were found to be superior as selective solvents. The two extraction methods described both depend upon agitation of the resin in a fluid state with alcohol, which extracts the undesirable fractions. In both, the desired fraction was contained in the residue after the extract-containing solvent had been removed by decanting or other method.

Insecticide Improvement

It is reported that insecticides high in hexachloro ethane, such as those used for killing moths and their larva, can be increased in effectiveness by the addition of small amounts of para-chloro bromo benzene, chloro napthalene .or para-dichloro-benzene.

Official U. S. Marine Corps photo

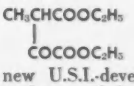
Ducking into a duck-covered foxhole. Colored pigments, incorporated with the resins and other ingredients in the duck-treating compound, provided the camouflage which baffled Jap airmen.

Valuable Uses Seen For New Intermediate Developed by U.S.I.

Ethyl *a*-Oxalpropionate Offered for Organic Synthesis Research

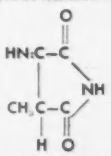
Ethyl alpha-oxalpropionate is a new U.S.I. product which affords another interesting example of the versatility of U.S.I.'s sodium ethoxide as a condensing agent. It is prepared by condensing diethyl oxalate with ethyl propionate in the presence of sodium ethoxide. It may also be synthesized from ethyl sodium oxalacetate and methyl iodide.

Alpha-oxalpropionate has the following physical characteristics: mol. wt., 202, sp. gr., 1.0977 @ 20°/20° C., refractive index, 1.433 @ 20° C., boiling point 108-109 @ 5.5 mm. Hg. abs. Color light yellow to colorless. It has the structural formula —



Like other new U.S.I.-developed Claisen condensation products, ethyl alpha-oxalpropionate appears to have many as yet unexplored uses as a starting material for organic synthesis. Some of these possibilities are suggested by the following reactions:

1. On distillation it loses carbon monoxide to give diethyl methylmalonate.
2. On heating with ammonia it forms alpha-methyl-beta-iminosuccinimide:



3. On boiling with alcoholic KOH it breaks down to propionic acid, oxalic acid, and alcohol.
4. On heating with ethyl iodide and sodium ethoxide it yields alpha-methyl-alpha-ethyl-oxalpropionic ester.

(*Continued on next page*)

B-Complex Vitamin Produced by Alcohol Crystallization

A recently granted patent covers new methods for producing dextro-pantothenic acid, part of the vitamin B complex, by resolving racemic pantothenic acid in to dextro pantothenic acid by fractional crystallization.

One method starts with d-l-barium pantothenate dissolved in ethanol. This solution is treated with an ethanol solution of quinine sulfate. The combined solution is freed from barium sulfate by centrifuging.

To remove the crystals of quinine salt of levo-pantotheic acid, they are precipitated by evaporating the solution and chilling. The mother liquors are then evaporated to dryness, and the residue dissolved in acetone, which separates the quinine salt, leaving dextro pantothenic acid.

The yield is about 23 per cent of the combined weight of the d-l-barium pantothenate and the quinine.

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Wool-like Synthetic Made from Peanuts

Peanuts, already widely used as a source of oils for salad dressing, margarine and high-grade soap, now are used as the raw material for a new synthetic fibre. The fibre is described as being like wool in many respects, and superior in others. For instance, it will not shrink, and is immune to attack by moths.

The new fibre, named Ardil, was developed in Great Britain, and is waiting the end of the war for large production. It is a cream-colored, crimped, resilient fibre which is said to be soft and warm to the touch, and to absorb moisture as wool does.

Ardil, according to its inventor, is not intended as a substitute for wool, but as a complementary fibre, to be used in combination with other fibres to impart new qualities to fabrics. It is expected that, under quantity production, the new fibre will turn out to be less expensive than wool.

Deodorant Reported To Neutralize Acids

In a suggested formulation, acid secretions of the body react with hexamine to liberate formaldehyde, which is antiseptic and astringent. As the acid becomes neutralized, decomposition stops, thus avoiding irritation which would occur from the use of formalin alone. The formula comprises 3 parts hexamine, 40 parts denatured alcohol, and orange-flower water to make 100.

New Intermediate

(Continued from preceding page)

5. On heating with dilute H_2SO_4 it gives propionylformic acid (alpha-oxobutyric acid), alcohol, and CO_2.

6. On hydrogenation it gives diethyl alpha-hydroxy-beta-methyl-succinate, which upon further hydrogenation forms 3-methyl 1, 2-butanediol, 2-methyl 1, 4-butanediol, and alcohols and water.

7. In alcoholic solution it gives an intense red color with ferric chloride.

Limited quantities of ethyl oxalpropionate are available from U.S.I. for research.

Treated Duck

(Continued from preceding page)

treated by this new process, for tents, tarpaulins, gun covers, webbing, and for the production of many other articles.

The Quartermaster Corps has set rigid requirements which must be met by all goods supplied. The applicable specification, JQD 242, is essentially based on performance tests, although the use of certain ingredients in the treating compound is generally considered mandatory. The use of certain other ingredients which may present objections is forbidden.

Resin Used

The compounds used by various suppliers differ somewhat, but in general they are composed of combinations of chlorinated paraffin, a high-quality hard resin and a plasticizing resin pigmented with antimony oxide, calcium carbonate and coloring pigments. These ingredients are usually dispersed in a volatile solvent and the resultant compound is applied by knifing on both surfaces of the canvas, or by impregnating the fabric by immersion in a bath of the liquid compound.

U.S.I. resins are playing an important part in this tremendous program which is now taking essentially the entire capacity of duck manufacturers and is utilizing the facilities of many textile finishers.

This textile development is destined to play an important role in the post-war era and resin-treated fabrics of this, and similar types, will be widely used for the manufacture of tarpaulins, awnings, commercial tentage and similar items. The knowledge and experience gained in the flame-proofing of canvas will also be utilized in the production of flame-retardant decorative and other fabrics.

Unsaturated Triglycerides Separated by New Process

Unsaturated triglycerides alone have greater utility than the natural oils and fats in which they occur. Particularly is this true of the drying oils used in coatings.

A patent has been granted on a new and simplified process for separating the unsaturated triglycerides from the mixture of saturated and unsaturated ones.

Natural oil containing a mixture of saturated and unsaturated triglycerides is mixed with ethanol and then heated. Upon cooling, the solution separates into a solvent layer and a precipitate layer. The solvent layer contains the unsaturated triglycerides.

TECHNICAL DEVELOPMENTS

Further information on these items may be obtained by writing to U.S.I.

Priority-free aluminum paint, which is said to be improved by increased pigment and solid content, and with a slower drying rate, is offered for exterior and interior use. One coat is said to cover metal, wood or concrete. **(No. 900)**

U S I

A rust dissolver, claimed to have a great affinity for ferrous oxide, and none for unoxidized metal, is on the market. The new product is slow drying, and thus has more prolonged rust-dissolving action. **(No. 901)**

U S I

A vegetable-tannin replacement, completely soluble in either hot or cold water, is announced as being the first complete synthetic alternate for vegetable tannins. Leather produced with it is claimed to be the equal of natural tannin products. **(No. 902)**

U S I

A photoelectric pH meter is described by its manufacturer as being valuable also as a colorimeter and turbidimeter. Meter is claimed to be accurate and to give direct readings. It is designed for operation with ordinary Pyrex test tubes. **(No. 903)**

U S I

A plastic coating, which may be heat-cured to form an insoluble film, is the claim made for a new liquid resin. Among suggested uses are linings for metal food containers and as an exterior protective coating on black iron. **(No. 904)**

U S I

Rubber-to-metal adhesion is said to be improved by a new priming compound. Among the uses suggested are as an ingredient in coatings and as a coating to impart acid and alkali-resistant qualities. **(No. 905)**

U S I

Fluorine-resistant glass is announced. Corrosive hydrofluoric acid, that disintegrates ordinary glass, is said to have no effect on the new product. It can be drawn, sheeted, blown, ground and polished. **(No. 906)**

U S I

A rate-of-flow meter, designed to operate by differential pressure and to give direct readings in gallons per minute, is announced. It is connected to the line by two tubes attached to two sides of an orifice plate. Meter can be calibrated to give full-scale reading on any differential pressure up to 10 lbs. per sq. in. **(No. 907)**

U S I

A multi-purpose pump, designed to handle a wide variety of viscous materials, such as paint, lacquer, mastic caulking compounds, cement coatings, and fibrous insulating materials, is now in production. **(No. 908)**

U S I

Synthetic resin seals, such as gaskets, washers and diaphragms, said to replace rubber, are being made to buyers' specifications. Among the qualities claimed are flexibility, elasticity, and resistance to abrasion and organic solvents. **(No. 909)**

U S I

A slime-controlling fungicide, for use in paper manufacture, is described as being tasteless and odorless, but is offered with the warning that it needs careful handling and is not recommended for paper whose end use is food packaging. **(No. 910)**

AMONG OUR FRIENDS

▸ William A. R. Welcke, vice-president and treasurer of Fritzsche Brothers, Inc., New York, N. Y., has recently been named a member of the Knights of Malta, one of the highest distinctions attainable by a Catholic layman in this country. This order, which was founded during the Crusades, was the Red Cross of its day and devoted itself primarily to care for the sick and wounded. Since its founding it has conferred membership only upon those outstanding in charitable work, whose time, effort and money have been generously given to the unfortunate. Mr. Welcke's quiet reserve and unassuming modesty have successfully concealed his many useful activities in the field of charity. As a consequence, his many friends and even his most intimate associates received the news of his rare honor with feelings of surprise and delight.

W. A. R. Welcke

▸ John ter Veer was honored on the occasion of his completion of twenty-five years service for Polak's Frutal Works, Inc., Long Island City, N. Y., on January 6th. Friends and associates entertained him at dinner and theatre party at that time. Mr. ter Veer started as assistant accountant for the parent company in Amerstoort, Holland, shortly after the first World War. In 1923, he was transferred to New York. In 1928 he became secretary of the company. Since then he has been active in the office management and purchasing department.

▸ Dr. and Mrs. Edgar G. Thomssen of Winona, Minn., are sojourning in Bradenton, Florida. Dr. Thomssen retired some months ago from active work in the toilet preparations industry which he had served for over a quarter of a century.

▸ Capt. Leon Danco of the aviation branch of the U. S. Marine Corps Reserve operating in the Pacific area has just been made a major according to advices received by his brother, Gerard J. Danco of Gerard J. Danco, Inc., New York, N. Y.

▸ Pierre L. Harang has been elected vice-president in charge of sales of Houbigant Sales Corp., New York, N. Y. He has been sales manager of the company for ten years, and has been associated with Houbigant for the past 22 years.

▸ Dr. and Mrs. Joseph Felton of the Felton Chemical Co., Brooklyn, N. Y., have returned from a well earned rest in Palm Beach, Fla.

▸ Capt. Paul J. Lynch, son of Joseph C. Lynch of the Pacific Coast Borax Co., New York, N. Y., has been awarded the silver star with oak leaf cluster for gallantry in action on two occasions on the Western front. He was wounded last August while fighting in the southern sector of Paris. A mortar shell exploded, wounding him in both legs and his right arm. He received the Purple Heart for his wounds and also the Silver Star with oak leaf cluster for gallantry in action. He is a veteran of the African campaign, Sicily and the Normandy invasion. He has been overseas 26 months and expects to have an opportunity to visit his parents for a brief while before long.

▸ Robinson Ord is serving as acting general manager of sales of Monsanto Chemical Co.'s Organic Division, St. Louis, Mo., pending the return to duty of Fred C. Renner. Mr. Renner is making a splendid recovery from a serious illness, but is unlikely to be back at work for some time to come.

▸ Richard C. Jones has been appointed director of packaging design by Revlon Products Corp., New York, N. Y., it has been announced by Charles Revson, president. Mr. Jones has formerly worked as a free lance artist and designer for Fifth Avenue department stores, and for cosmetic manufacturers. As a hobby he paints murals for private homes, and does book designing as well.

▸ C. K. Wellenkamp has been appointed vice-president in charge of the aromatic division of the General Drug Co., Brooklyn, N. Y., it has been announced by Earl I. McClintock, president. Mr. Wellenkamp has been manager for the past fifteen years. He makes his headquarters at 125 Barclay St., New York, N. Y., in the World-Telegram Building. The company's warehouse and laboratory remains at 644 Pacific St., Brooklyn, N. Y. The General Drug Co. is a subsidiary of the Winthrop Chemical Co.

C. K. Wellenkamp

▸ Fred J. Beyer was elected executive vice-president of P. R. Dreyer, Inc., essential oils and aromatic chemicals firm, New York, N. Y., at a recent meeting of the stockholders. Mr. Beyer has recovered from his recent illness and has returned to the office to assume his new duties.

▸ James H. Ewing has joined S. B. Penick & Co., New York, N. Y. He was previously associated with the Calco Chemical Div. of the American Cyanamid Co.

▸ Mary A. Rolland, formerly of the War Production Board, Aromatics and Intermediates Branch, Washington, D. C., has joined the staff of General Drugs Co., Aromatics Division. She will assume her duties immediately in the company's new quarters at 125 Barclay St., New York, N. Y. In the War Production Board Miss Rolland was in charge of priorities for Aromatics and Intermediates, and was administrator on the allocation orders for benzaldehyde and diphenylamine. As a chemist, Miss Rolland has had considerable experience in research, development and teaching in the biochemical field. She is a Fellow of the American Institute of Chemists.

News and events

TGA Convention Cancelled

At a meeting of the Executive Board of the TGA it was voted to cancel the 1945 annual convention which was to be held May 16 to 18.

Tourneur Products Buys Building

Tourneur Beauty Products, Inc., has bought the building at 588 Fifth Ave., New York, N. Y. The firm plans to use the entire eight-story building.

Associated Distributors Sales Meeting

On January 8, a sales conference was held by Associated Distributors, Inc., in Chicago, Ill. The meeting was presided over by David Kendall, general manager. Lewis J. Ruskin, the new owner and president of the company spoke on company plans for 1945.

Lentheric Holds National Sales Meeting

All members of the Lentheric, Inc., sales staff and training supervisory staff met in New York, N. Y., where the home office is located during the week of January 7. Speakers were W. D. Canaday, vice-president in charge of sales and advertising; Carleton H. Palmer, Chairman of the Board of Directors; C. S. Gage, vice-president; W. D. Northrup, assistant sales manager; Miss Jill Jessee, promotion manager; Frank McIntosh, vice-president and art director; Frank Wild, treasurer; Kurt Loesch, vice-president in charge of production, and Dr. Ernest Guenther of Fritzsche Brothers, Inc.

This was the first national get-together in three years due to wartime travel restrictions, although a number of regional meetings have been held at intervals in key cities by Mr. Canaday on spring and fall sales trips throughout the country.

System for Importing French Essential Oils

The United States Commercial Co. will accept requests from importers for essential oils and floral products from France, pending restoration of private trade. No essential oils have been received from France since the United States entered the war.

Gerald Strauss, U.S.C.C. representative in France, will act for importers deserving such assistance. Importers who wish to obtain French essential oils may obtain the form of the purchase agreement by writing to C. J. Horney, General Commodities Division, U. S. Commercial Co., Temporary T Building, Washington, 25, D. C.

Glycol Ethers Small Order Exemption Lowered

That part of General Allocation Order M-300 covering glycol ethers has been amended to lower small order exemptions from 4000 to 400 pounds.

Collapsible Tube Order Amended

The amendment to the collapsible tube order, M-115, limits the use of lead in collapsible tubes (other than military) during the first quarter to 15 per cent of the amount used in the first six months of 1944.

Members of the Toiletries and Cosmetics Industry Advisory Committee have advised that toothpaste, lather-type shaving cream, cream mascara and depilatories should be given prior claim on the limited supply of collapsible tubes.

Packaging Institute Cancels Semi-annual Meeting

The Packaging Institute, Inc., Board of Directors voted unanimously at their January 10 meeting to abandon the regular semi-annual Dinner Meeting, scheduled for April 18.

Selling and Ad Costs Not Allowed as Part of Tax Base

A case which has been very much before the trade was settled on January 15 when the U. S. Supreme Court held that F. W. Fitch Co., Des Moines, Iowa, has not the right to include selling and advertising costs to their selling prices in computing manufacturers excise taxes on toilet goods under the revenue act of 1932.

The question came up when the Fitch Co., brought suit to recover a portion of the tax which had been paid between October 1, 1936, and June 30, 1939.

Mme. Huntingford Bought by Associated Distributors

Associated Distributors, Inc., Chicago, Ill., has purchased Mme. Huntingford, Inc., from Truman Bradley and Elene Bradley Miller.

The business was started by the daughter of a prominent London surgeon, who sold her interest to the former owners ten years ago.

The line is now distributed in the midwest area, but will be expanded to other parts of the country as soon as production conditions permit.

Roger & Gallet Moves

Roger & Gallet has moved its offices to 11 West 42 St., New York, N. Y.

Kitchen-Olmstead Succeed Marshall in WFA

Lee Marshall has resigned from WFA to return to private business. C. W. Kitchen has been named to succeed him as director of the Office of Marketing Services, and Lt. Col. Ralph W. Olmstead has been appointed vice-president and Director of Supply of the CCC.

C. W. Kitchen is a veteran employee of the Department of Agriculture, where he has been closely connected with all phases of marketing research and service and regulatory work since 1912. Before the war he was Chief of the Agricultural Marketing Service and during the war has been Deputy Director of the Office of Distribution.

C. W. Kitchen

Lt. Col. R. W. Olmstead

Lt. Col. Olmstead began work with the Department of Agriculture in 1939, when he served as assistant to the Secretary of Agriculture. Later he was Assistant Administrator of the Food Distribution Administration. During the last year he has been Deputy Director for Supply in the Office of Distribution.

TGA Reports Gain in Members

The Toilet Goods Assn. has reported an increase in the number of its members during the year 1944. On December 31, 1943, there were 352 members. This number increased to 456 one year later. They were divided into 308 active, and 148 associate members.

N. Y. Pharmaceutical Assn. Cancels Convention

At a meeting of the Executive Committee of the New York State Pharmaceutical Assn., held January 18, it was voted to cancel the annual meeting and convention. The meeting was scheduled for June.

Remus & Co. Open Kansas City Office

Edward Remus & Co., New York, N. Y., have opened an office at 908 Central St., Kansas City, Mo. The office will be under the supervision of Richard Remus, who will be assisted by George M. Cox. Mr. Cox was formerly with Standard Synthetics, Inc.

All Leading Chemical Firms at Cosmetic Credit Assn. Dinner

Despite the fact that it was necessary to decline 100 reservations, the annual winter party of the Drug, Cosmetic and Chemical Credit Men's Association at the Hotel George Washington, New York, N. Y., on the evening of February 2 was the best attended in the history of the organization. Exactly 152 different firms, including, with two exceptions, all of the outstanding firms in the chemical industry, were represented among the 250 members and guests present.

Following a cocktail party which was marked by informal gatherings, the annual dinner was served after which professional entertainment of a high order was presented and enjoyed. A $200 moving picture camera was raffled off and was won by R. Deter, of the Westvaco Chlorine Products Corp., a wounded veteran who had just been discharged from the U. S. Marines.

At the conclusion of the ceremonies Chairman E. P. Utter presented retiring Chairman E. Kavanagh with a war bond and a selection of neckties as a token of appreciation for his faithful service in the past year.

C. Toto of Cole Laboratories entertained at his table Thomas J. Hughes and William Lakeman of the Crown Can Co., M. J. Conway of Michigan Alkali Co., L. Wizeman of National Aniline & Chemical Co., R. S. Hatfield of Continental Can Co., Murray Miller of Retort Pharmaceutical Co., D. D. Catts of Cole Laboratories and Mr. Zeising of Carbide & Carbon Chemicals Co. Fred Sturm entertained a party of ten Monsanto Chemical Co. officials and their wives; and W. E. Foster of Shoup-Owens, Inc., also entertained a large party. Charles Robinson of Phoenix Metal Cap Co., former chairman and Ray Halliday of E. Fougera & Co. were noted among the guests.

Charles Darr of Harriet Hubbard Ayer and William Zimmerman represented the BIMS at the party, the former being in very good voice. At the P. R. Dreyer, Inc., table Paul Schaupp entertained ten guests. Among others noted at the dinner were: Gus Schultz, comptroller of Merck & Co.; Robert Hoeckelman, comptroller of American Cyanamid & Chemical Co., and Robert Freese, treasurer of the Catalin Corp.

The complete success of the affair was due largely to the work of E. P. Utter, chairman, E. Maloney, chairman of the entertainment committee, Joseph Lynch and Nat Otte.

Houbigant Holds Sales Meeting

The sales staff of Houbigant Sales Corp., New York, N. Y., including special representatives, attended the annual general sales meeting which opened at the Hotel Roosevelt on January 5. Pierre Harang, newly elected vice-president, presided over the meeting, a considerable part of which was devoted to post-war plans.

War Labor Board Permits Increase

General Order No. 30, has been revised to permit salary and wage adjustments to be made without approval by the War Labor Board, so long as the rate does not come to above 50c. per hour.

Clay from Purua Hot Springs in New Toilet Preparations

Laboratorio Purua S. A. has been organized by a group of prominent industrialists in Mexico City to manufacture a night cream, a body cream and toilet soap which, the company states, will incorporate the invigorating chemical properties that are present in the clay of the hot springs of San José, Purua, in Mexico.

The therapeutic qualities of these springs are said to have been known for at least four centuries. Hernan Cortez according to legend was told of the springs and of their wonderful medicinal properties by the Indians and the Spanish conquerors knew that the Indians after a battle went to San José, Purua, to heal their wounds in the waters of the hot springs. Since their discovery far back in history the springs have been a mecca for the natives and in modern times for tourists seeking the benefits of the springs. Many celebrated screen stars have visited the springs.

The officers of Laboratorios Purua are: Angel Urraza, who is also president of the Goodrich Rubber Co. in Mexico, president; José Henriques Guzman, president of Purua Hot Springs, vice-president; Edmund Phelan, head of the Canada Dry interests in Mexico, director; and José M. Valles, Ph.D., president of Laboratorios Andromaco S. A., treasurer. Fernando A. Rubio, M. D., Phar. D. is general director of the company. Some years ago Dr. Rubio organized the highly successful Laboratorios Andromaco S. A. which manufactures ethical pharmaceuticals sold throughout Latin America. Dr. Rubio is collaborating with Dr. Henri Coutinho, former director of research of the George W. Luft Co., New York, N. Y. and now president of the Perfumers Manufacturing Corp. in creating and packaging the creams and toilet soaps. A masque for use in beauty salons will be added to the line of beauty products.

The trade mark includes the coat of arms of Michoacan with the crown of Hernan Cortez at the top. The articles are attractively packaged; the night cream in 4-oz. jars, the body cream in 8-oz. jars and the toilet soap three cakes to the box.

DCAT Commended by ODT for Cancelling Annual Dinner

The Drug, Chemical and Allied Trades Section of the New York Board of Trade has received a letter of commendation from the Office of Defense Transportation upon its cancellation of its 20th annual dinner. This was done in deference to the request of the Government authorities to eliminate large gatherings.

Givaudan-Delawanna Employees Decorated

The Distinguished Flying Cross has been awarded to two employees of Givaudan-Delawanna, New York, N. Y. The awards were presented to Technical Sergeant Stephen R. Novak for "courageous service to his combat organization" and to Staff Sergeant Peter Cousoulis for "extraordinary achievement during 35 heavy bombardment missions over Germany and German occupied Europe."

Sergeant Vasil Flak of the company received the Silver Star Medal and the Navy Legion of Merit, being credited with having saved the lives of 90 men in the invasion of Sicily.

Essential Oil Assn. Annual Meeting

The Essential Oil Assn. of U. S. A. held its annual meeting on January 12, in New York. John H. Montgomery, president, spoke on the supply situation as affected by the cessation of hostilities in Europe. M. Lemmermeyer, chairman of the committee on aromatics, reported on work done with acetophenone, amylcinnamic aldehyde, and fatty aldehydes. Dr. Eric Kunz, scientific committee chairman, reviewed standardization activities.

John H. Montgomery

William Schilling, Jr., reported four new members: The Centflor Co., New York, N. Y.; The General Drug Co., New York, N. Y.; Neumann, Buslee & Wolfe, Chicago, Ill., and the Syntomatic Corp., New York, N. Y.

F. K. Goudsmith, chairman of the export committee, discussed problems in the export trade, and relations with the FEA. The following officers were elected: John H. Montgomery, president, Fritzsche Brothers; William Schilling, Jr., vice-president, Norda Essential Oil & Chemical Co.; Robert B. Magnus, secretary-treasurer, Magnus, Mabee & Reynard, Inc. Other members of the executive committee were Frederick G. Bueher and Louis Rapin. Ray C. Schlotterer is managing director of the association. The meeting had the largest attendance in its history.

Tributes Paid to Martin Schultes at BIMS Annual Banquet

Tributes to Martin Schultes, founder and chairman of the BIMS, were paid by the speakers and members at the annual dinner in the Hotel Lafayette, New York, N. Y. on the evening of January 25. Mr. Schultes suffered a heart attack the day before the meeting and was unable to be present.

In place of Mr. Schultes, Charles Darr acted as chairman and Burton T. Bush in his tribute called attention to the appropriateness of the last part of the fourth paragraph of the greeting on the menu to service men as especially fitting. It read: "To You in hospitals . . . may you receive the tender care that we would give you and may you soon be well again." The meeting was for members only and each table made up on the menu card at the suggestion of Mr. Darr, a list of members at the table together with a special greeting to Mr. Schultes. These were collected and forwarded to Mr. Schultes. As we go to press advices from the Fifth Avenue Hospital, New York, where he is undergoing treatment, report that Mr. Schultes is showing encouraging progress.

Chicago Perfumery, Soap & Extract Assn. Banquet

The Chicago Perfumery, Soap and Extract Assn. celebrated its annual Christmas banquet and ladies' party on December 9th in the Grand Ballroom, Stevens Hotel, Chicago, Ill.

The record-breaking attendance of more than 700 members and guests paid a real tribute to the progress of the Association in 1944 under the leadership of President, Joseph A. Gauer.

Sparhawk Gets Patent for Producing Musk from Animal Sources

A patent with eight claims on a method of producing musk from muskrats, skunks, mink, deer and other animal sources has been granted to Charles V. Sparhawk, Sparkill, N. Y. The application for the patent was filed June 13, 1941.

One of the points in the process covered by the patent consists in treating the glands in a solid, frozen condition which makes it possible to grind and handle the animal tissues in a concentrated form that is firm, dry and readily subjected to the necessary solvents. It also is stated to make the defatting treatment complete and thorough, thus eliminating any trace of obnoxious ingredients.

After filing claims in June, 1941, Mr. Sparhawk corresponded with the conservation department of Louisiana seeking information on the possibility of obtaining muskrat glands from that state. At the request of the Louisiana authorities all the facts discovered by Mr. Sparhawk as to the best means of obtaining musk from the American muskrat were supplied to them. A year later findings by scientists in the Louisiana State University and Yale University on the isolation of fractions from American muskrats were published.

Florasynth Executives Find Outlook Favorable

After discussing various factors in the general business situation, executives of Florasynth Laboratories (Canada) Ltd. who gathered at their annual meeting in Montreal, January 15, found the outlook for the coming year to be favorable.

Dr. Alexander Katz, president of Florasynth Laboratories, Inc., was welcomed by Jack Lewis, managing director of the affiliated Canadian company. Those present included: Dr. Katz, William Lakritz, executive vice president; Charles P. Kramer, secretary, and Joseph Fein, treasurer of the parent company and Mr. Lewis.

Dr. Katz reported briefly on research work that he has been doing with Dr. Alvah G. Hall, dean of the College of Pharmacy of the University of Southern California on the toxicity and sensitivity tests of various materials used in the cosmetic and flavoring industries. H. Robert Patterson of the University of Southern California is actively engaged in this research work. Incidentally, Dr. Katz is chairman of the Scientific Research Committee of the Flavoring Extract Manufacturers Assn.

Odell Co. Appoints Officers

Following the death last July of Reuben Odell, president and founder of R. Odell & Sons Co., and the Odell Co., Newark, N. J., a re-alignment of executive personnel of both companies has been made. Present officers of the Odell Co. are: Sheldon R. Odell, president; Pennell L. Odell, vice-president; William McKinley Odell, vice-president; Albert W. Odell, treasurer, and Charles H. Holzwarth, secretary. Officers for R. Odell & Sons Co. are: Pennell L. Odell, president; William McKinley Odell, vice-president; Albert W. Odell, vice-president; Charles H. Holzwarth, treasurer, and Sheldon R. Odell, secretary. A. Alan Rattiner has resigned as general manager.

Selected Book List

COMMERCIAL METHODS OF ANALYSIS. By Foster Dee Snell & Frank M. Biffen. Just published. This valuable book covers practical analysis of typical products and gives procedures and calculations for hundreds of determinations—plus many pointers on general approach to analysis of unknown samples. Special emphasis is laid on time-saving methods in line with economic standards of the efficient commercial laboratory. Of constant use as quick reference to experienced chemists—invaluable to new chemists. 753 pages. 152 illustrations . . . $6.00 postpaid.

THE LAW OF FOODS, DRUGS & COSMETICS. By Harry A. Toulmin, Jr., J. D., Litt. D., LL.D. With introduction by Hon. Paul V. McNutt, former Federal Security Administrator. All manufacturers need a copy of this book. A practical working manual. Contains official government regulations, FDA trade correspondence rulings, official forms and charts. Gives thorough analysis of the decisions relating to: False and Misleading Advertising, Unfair Competition and Misbranding, Informative Labeling. One large volume, 1460 pages . . . $17.50 postpaid (will be kept up-to-date with pocket supplements for modest additional charge).

HAIR-DYES & HAIR-DYEING. By H. Stanley Redgrove & J. Baru-Woollss. Completely revised edition of this standard work. The most complete treatise on subject yet written in any language . . . $5.00 postpaid.

THE COSMETIC FORMULARY. Vol. 1. By H. Bennett. The most comprehensive compilation of practical, commercial and experimental cosmetic manufacture. No theory. For chemist, manufacturer, student, experimenter. Hundreds of valuable formulae. Working methods and equipment. Sources of raw materials, giving trade names and rarer products . . . $3.80 postpaid.

PRACTICAL EMULSIONS. By H. Bennett. Gives proper understanding of the technique and formulation that is necessary to produce a good emulsion. Covers all types of emulsions . . . $5.00 postpaid.

THE CHEMISTRY & MANUFACTURE OF COSMETICS. By Maison G. de Navarre, Ph.C., B.S., consulting Chemist to the Drug and Cosmetic Industries, Member of the Faculty of Wayne University. A new kind of cosmetic book in which an expert gives you tested formulas and practical suggestions for making all up-to-date cosmetics—based on complete fundamental knowledge. Gives the basic properties, including standards and specifications, for all raw materials. Describes the proper equipment for every purpose and operation, showing you every step in its operation and use. Tells you how to comply with governmental regulations at every point. Includes a wealth of material found in no other book . . . Illustrated . . . 745 pages . . . $8.00 postpaid.

AMERICAN SOAP MAKER'S GUIDE. By P. B. Meerbott & I. V. Stanley Stanislaus. Up-to-minute treatise on art and science of manufacture of soap, candles and allied toilet preparations. Third, completely revised, edition of this exhaustive book—covers all new developments. 700 pages. 105 illustrations . . . $7.50 postpaid.

HENLEY'S 20TH CENTURY BOOK OF 10,000 FORMULAS, PROCESSES & TRADE SECRETS. New 1944 revised and enlarged edition. A wealth of practical, accurate knowledge and guidance. Formulas for almost everything imaginable. New ways of doing things. Technical processes. It has helped thousands make more from their present businesses and professions. Over 900 pages . . . $4.00 postpaid.

ROGERS' MANUAL OF INDUSTRIAL CHEMISTRY. Edited by C. C. Furnas. New sixth edition of this master reference work. Gives all essential facts, figures, methods, operations of every important chemical industry in America —each industry covered by an expert. Details present-day methods and processes. Two big volumes. 1685 pages. 501 illustrations . . . $17.00 postpaid.

COSMETIC DERMATOLOGY. By Herman Goodman. 54 chapters covering the field from acne to vitamins and hormones . . . $6.50 postpaid.

COSMETICS & HOW TO MAKE THEM. By Robert Bushby. This simply-written practical guide for beauty specialists, hairdressers and all others concerned with preparation of face powders, vanishing creams, nail polishes, rouges, lipsticks and other cosmetics is a useful handbook for those who have had no previous knowledge of chemistry. Contains easy-to-follow formulas and recipes. Illustrated . . . $3.00 postpaid.

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Packaged Cosmetics Regulation Amended

Prices on sales by manufacturers to distributors may be adjusted through Amendment 6 to MPR-393. Under this Amendment the following conditions must be met: 1. The contract providing for the periodic price adjustment must have been in existence prior to March 1, 1942. 2. The manufacturer must sell to a purchaser substantially his entire output of packaged cosmetics, other than those for export. 3. The application must be made by the manufacturer and purchaser. 4. The adjustment sought will not result in the manufacturer receiving more proportionally in net profits than he averaged during the calendar years 1936-1941. 5. The purchaser must agree not to increase maximum retail prices.

Chicago Perfumery, Soap & Extract Assn. Elects Officers

The annual meeting and luncheon of the Chicago Perfumery, Soap and Extract Assn., Inc., for the election of officers was held on December 12 at the Bismarck Hotel, Chicago, Ill.

The following officers were elected for 1945: President, F. A. Degener, Heyden Chemical Corp.; vice-president, Walter R. Nay, Mallinckrodt Chemical Wks.; secretary, Carl Edwards, Fritzsche Brothers, and treasurer, Martin Vance, Givaudan-Delawanna, Inc.

The retiring officers were: Joseph A. Gauer, president; F. A. Degener, vice-president, and Herbert Rothschild, secretary and treasurer.

Obituary

Don Stephen Mayham

Don Stephen Mayham was killed in action on November 15, 1944, in Metz, France. He was attending Johns Hopkins University at the time of his entry into the Army, but was transferred subsequently to Pennsylvania State University, and assigned to study engineering. Requiem mass was said for him at Our Lady Queen of Martyrs Church, Forest Hills, N. Y., on January 10, at 10 a.m. He was twenty-two years of age. Surviving are his father, S. L. Mayham, executive vice-president of the Toilet Goods Association, and his mother.

Alden Ray Vicary

Alden Ray Vicary died Wednesday, January 6, 1945, at his home in the Parkstone Apartments in Detroit. Mr. Vicary had been general manager and treasurer of the Mark W. Allen Company of Detroit. He was a graduate of the Ontario College of Pharmacy, past President of the Allied Drug and Cosmetic Association and life member of the Executive Committee of that Association. He was a member of the Great Western Lodge F. and A.M. He served his pharmaceutical apprenticeship in Sarnia, Ontario, and later became affiliated with the Seely Manufacturing Company of Windsor, Ontario. After he became affiliated with the Mark W. Allen Company, he continued living in Windsor and only at the start of the war did he transfer residence to the United States. He is survived by his wife Frances and his brother, John of Windsor, Ontario.

MARKET REPORT

ANNOUNCEMENT of a 25-cent advance in California orange oil prices and the arrival of about 13,000 bags of gum arabic provided the many features noted in the raw materials market over the past month. The advance in orange oil was the first change since last June and followed closely the announcement by the War Food Administration that it would accept bids for furnishing 15,400 pounds of cold pressed orange oil.

AROMATIC SUPPLY TIGHT

Shipping prices on Florida oil rose in sympathy with the upward trend in California orange and virtually all cheap lots of Brazilian oil were absorbed as the result of more active trading between dealers. Essential demands for such basic materials as toluol, benzol, benzaldehyde, and various other articles were reflected in a further tightening in the supply of aromatic chemicals. The labor shortage also tended to aggravate the situation. From a supply standpoint the aromatic chemical market was stronger than at any time since the beginning of World War II.

UNCERTAINTY OF FRENCH IMPORTS

Lemongrass which displayed a rather soft tone during the fall months is now back at the price level of last summer. The complete reversal in the trend came about as the result of the general feeling of uncertainty that has developed regarding replacements. Under present circumstances it is virtually impossible to predict with any degree of accuracy whether lemongrass will be arriving in any quantities. Advices from India indicate that producers lack the necessary containers to make further shipments. The Foreign Economic Administration has announced that the U. S. Commercial Company will accept requests from importers for essential oils and floral products from France. It was very clearly indicated by the agency, however, that such requests cannot be expected to be filled until the restoration of private trade. A preliminary report on this subject by Lester A. Barber, specialist in the Auxiliary Foreign Service Corps of the Department of State who has been in Paris making a study of the supply situation of essential oils, stated that the ability of the French essential oil industry to export in pre-war volume to the United States is very uncertain and varies widely with respect to specific commodities. Reports from other reliable directions state that only ten to twenty per cent of the floral oils normally required by the United States will be available. It is pointed out that if alcohol, retail bottles and foreign essential oils were freely available, the French perfume industry would probably consume all of the Grasse production.

It is interesting to note, however, that the value of cosmetics produced in the United States increased from $219,000,000 in 1939 to $408,000,000 in 1944, according to WPB figures. While part of the rise can be attributed to higher prices, nevertheless, it is believed the poundage and liquid volume also increased which might be considered as a decided achievement in view of the many shortages that have developed since the outbreak of war.

MENTHOL PRODUCTION DOUBLED

The trend in Brazilian menthol prices proved highly interesting over the past month in the light of reports to the effect that coming production will be more than double the 1944 output, and the fact that some twenty tons or more are believed to be in the hands of local sellers. Any menthol that will be used over the current season has long since been incorporated in finished products and contrary to the belief of some local sellers demand for spot goods between now and April will be extremely limited.

Little if any forward buying has been noted in Brazil. The high prices at which American consumers paid for menthol last year has unquestionably stimulated production, and it remains to be seen whether producers in the primary center will be able to maintain current quotations in the absence of a sufficient demand from America to absorb increased supplies. Attempts to get higher prices for material in this market so as to influence quotations covering new production in Brazil, will, it is believed, fail.

The arrival of new lots of gum arabic was the first in about six months, and at the close of last month about half of the shipment had gone into consuming channels. The firmer attitude displayed on the part of local houses was attributed to the uncertainty regarding additional replacements from the primary center. Under present circumstances some houses feared that it may be another six months before additional lots reach this market.

VANILLA BEAN SHIPMENTS

Another arrival of Bourbon vanilla beans is expected momentarily amounting to 85 tons and a third lot of about 30 tons is reported about ready for shipment. It is not likely that any further shipments to the United States will be possible. The French Colonial Government at Madagascar it is said is planning to reserve all future production and remaining supplies of beans for France. Disregarding ceilings at which importers are permitted to sell Mexican vanilla beans in this market, curers in Mexico paid exceedingly high prices for green beans. Under the circumstances local houses do not hold out much hope of obtaining new crop Mexican beans.

Those who recover crude glycerine express more confidence regarding a future outlet for their material since it is understood that a contract made last year for 2,000,000 pounds of Argentinian crude has fallen through because of lack of shipping space. The contract was for Dec. shipment.

PRICES IN THE NEW YORK MARKET

(Quotations on these pages are those made by local dealers, but are subject to revision without notice)

ESSENTIAL OILS

Almond Bit, per lb.	3.50@	4.00
F. P. A.	4.75@	5.10
Sweet True	1.25@	1.75
Apricot Kernel	.56	Nom'l
Amber, rectified	2.25	Nom'l
Angelica Root	125.00@	150.00
Anise, U. S. P.	4.00	Nom'l
Imitation	1.75@	2.10
Aspic (spike) Span.	3.75@	4.00
Avocado	1.05@	1.25
Bay	1.45@	1.70
Bergamot	8.00@	8.50
Artificial	4.00@	9.25
Birch, sweet	3.00@	5.00
Birchtar, crude	2.25	Nom'l
Birchtar, rectified	4.25	Nom'l
Bois de Rose	4.75@	5.10
Cade, U. S. P.	1.00@	1.25
Cajeput	2.35@	3.00
Calamus	22.50@	35.00
Camphor "white," dom.	.35@	.45
Cananga, native	12.50@	13.00
Rectified	15.00@	16.25
Caraway	18.00@	20.00
Cardamon	28.00@	32.00
Cassia, rectified, U. S. P.	12.00	Nom'l
Imitation	3.75@	
Cedar leaf	1.35@	1.60
U. S. P.	2.65@	3.34
Cedar wood	1.00@	1.10
Celery	20.00@	24.00
Chamomile	150.00	Nom'l
Cinnamon	15.00@	18.75
Citronella, Ceylon	1.00@	1.10
Java	3.25	Nom'l
Cloves, Zanzibar	1.75@	1.80
Copaiba	.85	Nom'l
Coriander	30.00@	32.00
Imitation	12.00@	14.00
Croton	3.50@	4.00
Cubebs	5.25	Nom'l
Cumin	8.50@	11.00
Dillseed	6.85	Nom'l
Erigeron	2.25@	5.00
Eucalyptus	1.09@	1.18
Fennel, Sweet	4.00	Nom'l
Geranium, Rose, Algerian	12.50@	15.00
Bourbon	10.00@	13.00
Turkish	5.00@	5.80
Ginger	21.00@	22.00
Guaiac (Wood)	4.00@	4.80
Hemlock	2.65@	3.34
Substitute	.55@	.60
Juniper Berries	12.50@	16.00
Juniper Wood, imitation	.65@	.80
Laurel	5.00	Nom'l
Lavandin	8.25	Nom'l
Lavender, French	9.00@	12.00
Lemon, Calif.	3.25	Nom'l
Lemongrass	1.75@	2.00
Limes, distilled	7.00@	7.75
Expressed	13.50@	15.00
Linaloe	3.65@	4.00
Lovage	95.00	Nom'l
Marjoram	7.25@	7.50
Neroli, Bigarde P.	300.00@	375.00
Petale, extra	265.00@	300.00
Olibanum	5.00@	5.75
Opopanax	30.00@	38.00
Orange, bitter	4.00@	4.25
Brazilian	1.50@	
Calif., exp.	2.00@	
Orris Root, abs. (oz.)	135.00@	
Artificial	36.00@	40.00
Pennyroyal, Amer.	4.00	Nom'l
European	4.10@	4.25
Peppermint, natural	7.50@	7.75
Redistilled	8.05@	
Petitgrain	1.80@	2.00
Pimiento	7.50@	8.00
Pinus Sylvestris	4.25@	5.00
Pumillonis	4.25@	4.75
Rose, Bulgaria (oz.)	30.00@	40.00
Synthetic, lb.	45.00@	55.00
Rosemary, Spanish	1.60@	1.75
Sage	4.85@	5.25
Sage, Clary	25.00@	30.00
Sandalwood, East India	7.00	Nom'l
Sassafras, natural	2.00@	2.15
Artificial	.95@	1.25
Snake root	12.00	Nom'l
Spearmint	4.00	Nom'l
Thyme, red	3.20@	3.75
White	3.65@	5.00
Valarian	40.00	Nom'l
Vetivert, Java	50.00	Nom'l
Bourbon	35.00@	38.00
Wintergreen	4.85@	8.50
Wormseed	5.25	Nom'l
Ylang Ylang, Manila	38.00	Nom'l
Bourbon	9.50@	12.00

(Continued on page 101)

PROFESSIONAL SERVICE

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The rates for advertisements in this section are as follows: Business Opportunities, $1.00 per line per insertion. Situations Wanted and Help Wanted, 50c per line per insertion. Please send check with copy. Address all communications to THE AMERICAN PERFUMER. 9 East 38th St., New York.

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WANTED: 2—Dry Powder Mixers; 2—Pony Mixers; 2—Tablet Machines; 1—Filter; 3—Kettles; 2—Filling Machines. No dealers. Write Box 2353, The American Perfumer and Essential Oil Review.

WELL ESTABLISHED wholesale drug house in Canada would consider additional lines for jobbers or drug trade. Manufacturing and packaging equipment available. Write Box 2498, The American Perfumer and Essential Oil Review.

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WANTED: 1 Colloid Mill, 5 to 20 Gallons capacity (Stainless Steel), 1 Monel Metal Percolator, 60 Gallons capacity. 1 Horizontal Filter, capacity 60-400 G. P. H. (Sparkler Preferred). No Dealers. Write Box 2516, The American Perfumer and Essential Oil Review.

BRAZILIAN industrial firm, giving best references, desires to contact an American company to produce in Brazil, articles of great demand based on the American process by means of royalty or any other kind of remuneration to be agreed on. Write Box 2518, The American Perfumer and Essential Oil Review.

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Creams, lotions, shampoos, etc. One or two good lines wanted by responsible organization fully conversant with production problems. Able to give excellent service and direct attention. Prefer quality product. Complete facilities. Laboratory control. Will use your formulae or supply our own. No rouges, lipsticks, or face powders. Write Box 2522, The American Perfumer and Essential Oil Review.

SITUATIONS WANTED

POSITION wanted by Compounder in essential oil industry. (New York City.) Write Box 2517, The American Perfumer and Essential Oil Review.

HELP WANTED

GRADUATE CHEMIST or Chemical Engineer, experienced in perfume and cosmetic manufacture to supervise production, research and testing laboratory. Excellent opportunity for right man. State age, training, experience, draft status, salary desired in first letter. Replies held in strict confidence. Write Box 2519, The American Perfumer and Essential Oil Review.

SALESMAN: One for Eastern Seaboard, one for Midwest, another for Greater New York, thoroughly experienced in handling high grade cosmetics, having good personal contacts with buyers department stores and better drug stores. Well established line of fine cosmetics. Write Box 2520, The American Perfumer and Essential Oil Review.

SALESMAN wanted for representation of a line consisting of toiletries, perfumes and gift ware. Write Box 2521, The American Perfumer and Essential Oil Review.

(Continued from page 99)

TERPENELESS OILS

Bergamot	25.00	Nom'l
Grapefruit	65.00@	
Lavender	28.00	Nom'l
Lemon	45.00	Nom'l
Lime, ex.	80.00@	100.00
Distilled	60.00@	67.00
Orange sweet	65.00@	112.00
Peppermint	13.35@	14.00
Petitgrain	3.50@	3.75
Spearmint	5.00@	6.00

DERIVATIVES AND CHEMICALS

Acetaldehyde 50%	1.90@	2.75
Acetaphenone	1.70@	1.80
Alcohol C 8	7.50	Nom'l
C 9	14.00	Nom'l
C 10	7.75@	12.00
C 11	11.50	Nom'l
C 12	7.20@	8.50
Aldehyde C 8	22.50@	28.00
C 9	32.00	Nom'l
C 10	22.00@	29.00
C 11	22.00	Nom'l
C 12	25.00@	30.00
C 14 (so called)	9.25@	9.75
C 16 (so called)	7.65@	8.25
Amyl Acetate	.50@	.75
Amyl Butyrate	.90@	1.10
Amyl Cinnamate	4.50@	5.80
Amyl Cinnamate Aldehyde	2.75@	5.00
Amyl Formate	1.00@	1.50
Amyl Phenyl Acetate	3.75@	4.00
Amyl Salicylate	.80@	1.00
Amyl Valerate	2.10@	2.75
Anethol	3.25@	3.50
Anisic Aldehyde	3.35@	4.00
Benzophenone	1.15@	1.30
Benzyl Acetate	.75	Nom'l
Benzyl Alcohol	1.50	Nom'l
Benzyl Benzoate	1.10	Nom'l
Benzyl Butyrate	2.15@	3.25
Benzyl Cinnamate	5.15	Nom'l
Benzyl Formate	2.50@	3.75
Benzyl-Iso-eugenol	10.25	Nom'l
Benzylidenacetone	2.25@	3.40
Borneol	1.80	Nom'l
Bornyl Acetate	2.00	Nom'l
Bromstyrol	6.25@	
Butyl Acetate	.18¼@	.18½
Cinnamic Acid	3.75@	4.50
Cinnamic Alcohol	3.85@	4.25
Cinnamic Aldehyde	2.65@	3.90
Cinnamyl Acetate	10.50@	12.00
Cinnamyl Butyrate	12.00@	14.00
Cinnamyl Formate	10.00@	13.00
Citral, C. P.	4.50@	7.00
Citronellol	6.50@	7.00
Citronellyl Acetate	8.60@	9.20
Coumarin	3.00@	3.50
Cuminic Aldehyde	8.00@	11.25
Diethylphthalate	.24	Nom'l
Dimethyl Anthranilate	4.55@	5.00
Ethyl Acetate	.25@	.35
Ethyl Anthranilate	5.50@	7.00
Ethyl Benzoate	.90@	1.15
Ethyl Butyrate	.75@	.90
Ethyl Cinnamate	3.50	Nom'l
Ethyl Formate	.70@	.95
Ethyl Propionate	.80	Nom'l
Ethyl Salicylate	.90@	1.00
Ethyl Vanillin	5.25@	6.00
Eucalyptol	2.85	Nom'l
Eugenol	3.30@	3.50
Geraniol, dom.	5.50@	6.00
Geranyl Acetate	4.00	Nom'l
Geranyl Butyrate	8.20@	8.50
Geranyl Formate	13.40	Nom'l
Heliotropin, dom.	6.50	Nom'l
Hydrotopic Aldehyde	15.00@	18.00
Hydroxycitronellal	8.50	Nom'l
Indol, C. P.	23.00@	26.50
Iso-borneol	1.10	Nom'l
Iso-butyl Acetate	1.25@	2.00
Iso-butyl Benzoate	1.50@	2.60
Iso-butyl Salicylate	2.70@	3.00
Iso-eugenol	4.00	Nom'l
Iso-safrol	3.00	Nom'l
Linalool	7.50@	8.00
Linalyl Acetate 90%	8.75@	9.00
Linalyl Anthranilate	15.00@	
Linalyl Benzoate	10.50@	
Linalyl Formate	9.25@	12.00
Menthol, Brazilian	13.75@	14.00
Methyl Acetophenone	1.80	Nom'l
Methyl Anthranilate	2.25@	2.40
Methyl Benzoate	.60@	1.00
Methyl Cellulose, f.o.b. shipping point	.60	Nom'l
Methyl Cinnamate	3.00	Nom'l
Methyl Eugenol	3.50@	6.75
Methyl Heptenone	3.50	Nom'l
Methyl Heptine Carbonate	45.00@	60.00
Methyl Iso-eugenol	5.85@	10.00
Methyl Octine Carbonate	24.00@	30.00
Methyl Paracresol	2.50	Nom'l
Methyl Phenylacetate	3.75@	4.00
Methyl Salicylate	.37@	.38
Musk Ambrette	4.25@	4.50
Ketone	4.35@	4.80
Xylene	1.65@	2.50
Neroline (ethyl ether)	2.00@	3.15
Paracresol Acetate	2.55@	3.00
Paracresol Methyl Ether	2.60@	2.85
Paracresol Phenyl-acetate	6.50@	8.50
Phenylacetaldehyde 50%	3.00	Nom'l
100%	5.00	Nom'l
Phenylacetic Acid	3.00@	3.75
Phenylethyl Acetate	2.50	Nom'l
Phenylethyl Alcohol	2.80@	3.00

(Continued on page 103)

INDEX TO ADVERTISERS

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Phenylethyl Anthranilate	16.00@	
Phenylethyl Butyrate	3.65@	4.00
Phenylethyl Propionate	3.45@	3.90
Phenyl Valerianate	16.00@	17.50
Phenylpropyl Acetate	10.00	Nom'l
Santalyl Acetate	20.00@	22.50
Scatol, C. P. (oz.)	5.35@	6.00
Styrolyl Acetate	2.50@	3.00
Vanillin (clove oil)	2.60	Nom'l
(guaiacol)	2.35	Nom'l
Lignin	2.35	Nom'l
Vetivert Acetate	25.00	Nom'l
Violet Ketone Alpha	18.00	Nom'l
Beta	15.00	Nom'l
Methyl	6.50	Nom'l
Yara Yara (methyl ester)	2.00@	3.10

BEANS

Tonka Beans, Surinam	.70@	.95
Angostura	2.00@	2.50
Vanilla Beans		
Mexican, whole	11.00@	
Mexican, cut	10.00@	
Bourbon	9.50@	10.50
Tahiti	4.00@	

SUNDRIES AND DRUGS

Acetone	.8½@	.09
Almond meal	.25@	.35
Ambergris, ounce	12.00@	16.00
Balsam, Copaiba	.60@	.75
Peru	.90@	1.25
Beeswax, bleached, pure		
U. S. P.	.58	Nom'l
Yellow, refined	.53½	Nom'l
Bismuth, subnitrate	1.20@	1.22
Borax, crystals, carlot ton	55.50@	58.00
Boric Acid, U. S. P., cwt.	6.95@	7.55
Calamine	.18@	.20
Calcium, phosphate	.08@	.08¾
Phosphate, tri-basic	.09@	.10
Camphor, domestic	.69@	.84
Castoreum	13.00@	17.00
Cetyl Alcohol	1.75	Nom'l
Pure	2.25	Nom'l
Chalk, precip.	.03½@	.06½
Cherry Laurel Water, jug, gal.	3.60@	4.00
Citric Acid	.21	Nom'l
Civet, ounce	18.00@	25.00
Clay, colloidal	.07@	.15
Cocoa, Butter, lump	.25½@	.27
Cyclohexanol (Hexalin)	.30@	.50
Fuller's Earth, ton	15.00@	33.00
Glycerin, C. P., drums	.15½@	.15¾
Gum Arabic, white	.42@	.45
Amber	.12¼@	.13
Powdered, U.S.P.	.18@	.21
Gum Benzoin, Siam	5.00	Nom'l
Sumatra	1.40	Nom'l
Gum Galbanum	1.80@	2.00
Gum Myrrh	.50@	.55
Henna, pwd.	.30@	.35
Kaolin	.05@	.07
Labdanum	3.25@	5.00
Lanolin, hydrous	.30@	.34
Anhydrous	.31@	.35
Magnesium, carbonate	.09@	.10¾
Stearate	.24@	.27
Musk, ounce	50.00	Nom'l
Olibanum, tears	.18@	.35
Siftings	.11½@	.13
Orange Flower Water, gal.	1.75@	2.25
Orris Root, African, pwd.	1.10@	1.15
Paraffin	.06¼@	.09
Peroxide	1.10@	1.75
Petrolatum, white	.06¼@	.08½
Quince Seed	1.65@	1.95
Rice Starch	.10	Nom'l
Rose Leaves, red	3.45@	4.00
Rose Water, gal.	6.50@	8.00
Rosin, M. per cwt.	6.72@	6.77
Salicylic Acid	.35@	.40
Saponin	2.00@	2.50
Silicate, 40°, drums, works, 100 pounds	.80@	1.20
Soap, neutral, white	.20@	.25
Sodium Carb.		
58% light, 100 pounds	1.35@	2.35
Hydroxide, 76% solid, 100 pounds	2.60@	3.75
Spermaceti	.26@	.27
Stearate Zinc	.30@	.31
Styrax	1.40@	1.60
Tartaric Acid	.64	Nom'l
Tragacanth, No. 1	4.35@	4.80
Triethanolamine	.34½	Nom'l
Violet Flowers	1.75@	2.00
Zinc Oxide, U. S. P. bbls.	.10½	.10¾

OILS AND FATS

Castor No. 1, tanks	.13@	
Cocoanut, Manila Grade, c.i.f., tanks	.0835@	
Corn, crude, Midwest, mill, tanks	.12¾@	
Corn Oil, distilled, drums	.16¼@	.16½
Cotton, crude, Southeast, tanks	.12¾@	
Grease, white	.08⅞@	
Lard	.1522½@	
Lard Oil, common, No. 1 bbls.	.14@	
Palm, Niger, drums	.0865	
Peanut, blchd., tanks	.1501@	
Red Oil, distilled, tanks	.12@	
Stearic Acid		
Triple Pressed	.18⅝@	.18⅞
Double Pressed	.15⅞@	.16⅞
Tallow, acidless, barrels	.14¼@	
Tallow, N. Y. C., extra	.08⅝@	
Whale oil, refined	.1232	Nom'l

Production Control and the Analysis of Cosmetics

by MAISON G. DENAVARRE, Ph.C., B.S.

Technical Editor of the American Perfumer & Essential Oil Review; Expert Consultant, Engineer Board, U. S. Army; Special Lecturer in Cosmetics, Wayne University, College of Pharmacy; Consulting Chemist

Twelfth Installment

The eleventh installment was published in the preceding issue. Subsequent installments will appear in forthcoming issues.

ACKNOWLEDGMENTS

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CHAPTER IV

(continued)

Physical and Chemical Testing Gravimetric and Volumetric Methods

C-131—CHOLESTEROL AND PHYTOSTEROL IN MIXTURES OF ANIMAL AND VEGETABLE FATS

(A.O.A.C.)

Alcohol Extraction Method—Tentative

(Not applicable in presence of hydrogenated soybean oil)

Introduce 200-300 gm of the melted fat into flat-bottomed liter flask. Close neck of flask with 3-holed stopper and insert through these holes: (1) a reflux condenser; (2) a right-angled glass tube, one arm of which reaches to a point 6 mm above surface of melted fat, the other being closed a short distance from flask by means of short piece of rubber tubing and pinch-cock; (3) a glass tube bent so that one arm reaches to bottom of flask and the other serves as delivery tube for a 700 ml round-bottomed flask containing 500 ml of alcohol.

Place flasks containing melted fat and alcohol on steam bath and heat so that alcohol vapor passes through the melted fat in the liter flask and is condensed in the reflux condenser, finally collecting in layer over the melted fat. After all alcohol has passed in this manner into flask containing the fat, disconnect flask from which the alcohol has been distilled and attach tube to the short piece of rubber tubing attached to right-angled glass tube, see (2) above, and siphon alcohol layer back into alcohol distillation flask. Reconnect as at first and again distil alcohol as in first operation. When all alcohol has been distilled, siphon it again into distillation flask and extract in same manner a third time.

Discard fat and retain alcohol, which now contains practically all cholesterol and phytosterol originally present in fat. Concentrate alcoholic solution to about 250 ml, and to boiling liquid add 20 ml of KOH solution (1 + 1). Boil for 10 minutes to insure complete saponification of fat,

cool to room temperature, and pour into large separatory funnel containing 500 ml of warm ether. Shake to insure thorough mixing and add 500 ml of H_2O. Rotate funnel gently to avoid formation of extremely stubborn emulsions, but mix the H_2O thoroughly with the alcohol-ether soap solution. A clear, sharp separation takes place at once. Draw off soap solution and wash ether layer with 300 ml of H_2O, avoiding shaking. Repeat washing of ether solution with small quantities of H_2O until all soap is removed. Transfer ether layer to flask and distil ether until volume of liquid remaining in flask measures about 25 ml. Transfer this residue to tall 50 ml beaker and continue evaporation until all ether is driven off and residue is perfectly dry. If desired, weighed beaker may be used and weight of unsaponifiable matter determined at this point.

Add 3-5 ml of acetic anhydride to residue in beaker, cover beaker with watch-glass, and heat to boiling over free flame. After boiling for a few seconds, remove beaker from flame, cool, and add 35 ml of alcohol, 60 percent by volume. Mix contents of beaker thoroughly, filter off alcoholic solution, and wash precipitate with the 60 percent alcohol. Dissolve precipitate on filter with stream of hot alcohol, 80 percent by volume, and wash insoluble portion well with the 80 percent alcohol. Acetates of cholesterol and phytosterol are dissolved, while the greater portion of impurities present (including paraffin and paraffin oil) remains on filter. Cool combined filtrate and washings to temperature of 10-12° and allow to stand at that temperature for 2-3 hours. During this time the acetates of cholesterol and phytosterol crystallize from the solution. Collect the crystals upon filter, wash with cold alcohol, 80 percent by volume, and then dissolve in minimum quantity of hot absolute alcohol. Collect the alcoholic solution of the acetates in small glass evaporating dish, add 2 or 3 drops of H_2O to solution, and heat if not perfectly clear. Allow alcohol to evaporate spontaneously, stirring contents of dish occasionally to mix deposit of crystals that form upon edges with main body of liquid. As soon as a good deposit of crystals has formed, collect them upon hardened filter; wash twice with cold alcohol, 90 percent by volume; and dry by suction, drying finally at 100° for 30 min. Determine melting point.

The melting point of first crop of crystals usually gives definite information as to presence or absence of phytosterol, but the conclusion indicated should be confirmed by recrystallizing the crystals from absolute alcohol and again determining melting point. If crystals are pure cholesteryl acetate, the melting point of second crop should agree closely with that of first. If phytosteryl acetate is present, however, a higher melting point will be noted, as phytosteryl acetate is less soluble in alcohol than cholesteryl acetate. The melting point of cholesteryl acetate is 114°; that of phytosteryl acetate, 125-137°.

Digitonin Method—Tentative

Shake vigorously 50 gm of the oil, or fat, for 15 minutes in separatory funnel with 20 ml of a 1 percent solution of digitonin in 95 percent alcohol. Allow mixture to stand for a time until emulsion separates. The lower or fat layer should be quite clear while the alcohol layer contains a bulky, flocculent precipitate. Draw off as much of fat as possible, avoiding any loss of precipitate. Add 100 ml of ether to alcohol layer and filter mixture. After drying in air wash precipitate with ether until free from fat, transfer to tall 50 ml beaker, and add 2-3 ml of acetic anhydride. Cover beaker with watch-glass. Boil slowly over low flame for 30 minutes. After cooling, add 30-35 ml of alcohol, 60 percent by volume, and mix contents of beaker slowly. Filter the alcohol solution. Wash precipitate with the 60 percent alcohol, then dissolve on filter with stream of hot alcohol, 80 percent by volume, from wash bottle, and set filtrate aside in cool place (10° or below). After acetates have crystallized out of this solution filter them off, recrystallize from absolute alcohol, dry, and determine melting point of each crop of crystals as directed above.

Courtesy, Fisher Scientific Co.

Figure 124. Extraction heater and support

The individual hot plates in this apparatus have 4¼-inch diameter polished steel tops, each of 300-watt capacity, equipped with a 3-heat switch and mounted on a heavy slate slab which is virtually immune to a wide variety of destructive agencies. Non-oxidizing, hermetically sealed heating elements insure a long life and are productive of high heating efficiency.

Being essentially a low heat rack, with wattages of either 75, 150, or the full 300 watts available by means of the convenient 3-heat switch, this rack is recommended for those extractions using ether or other volatile solvents.

All line wiring is concealed in the metal base in compliance with National Board of Fire Underwriters' Specifications. No electric cord and plug are included, since connection should be made direct to a power line of ample capacity.

The dimensions are: overall length, 30 inches; overall depth, 7 inches; overall height, 30 inches; height to top of hot plates, 8⅝ inches.

C-132—CINNAMIC ACID AS AN IMPURITY IN BENZOIC ACID, DETECTION OF THE USE OF DINITROPHENYLHYDRAZINE TO DETECT

(*Luis Rossi and Aeturo Tronsco Serants. Anales asoc. quim. argentina* ***31****, 60, 1943*)

The presence of cinnamic acid in benzoic acid can be often detected in a drop of solution by oxidizing the former to benzaldehyde with its characteristic odor. For this purpose $NaBiO_3$ is most satisfactory as oxidant. With dinitrophenylhydrazine, however, a somewhat more satisfactory test can be made and the reagent does not react with benzoic or salicylic acids; an orange-yellow precipitate is obtained of dinitrophenylhydrazone. Eight gamma can be detected at a concentration of 1:125,000. (*Thru C. A.* ***38****, 527, 1944.*)

C-133—CITRATE

(*U.S.P.*)

To a solution of 5 cc of a citrate (1 in 10) add 1 cc of calcium chloride T.S. and 3 drops of bromothymol blue T.S., and slightly acidify with diluted hydrochloric acid.

Add tenth-normal sodium hydroxide until the color changes to a clear blue; then boil the solution for 3 minutes, agitating it gently during the heating period; a white, crystalline precipitate appears in the liquid. This precipitate is insoluble in sodium hydroxide T.S., but dissolves in diluted hydrochloric acid.

When to a solution of a citrate, one-tenth of its volume of mercuric sulfate T.S. is added, the mixture heated to boiling, then potassium permanganate T.S. added, a white precipitate is produced.

C-134—CITRIC ACID

(*U.S.P.*)

Assay: Place about 3 gm of citric acid in a tared flask and weigh accurately. Dissolve the acid in 40 cc of distilled water, and titrate with normal sodium hydroxide, using phenolphthalein T.S. as the indicator. Each cc of normal sodium hydroxide is equivalent to 0.07005 gm of $H_3C_6H_5O_7.H_2O$. (See also C-4.)

C-135—CITRIC ACID, QUANTITATIVE PRECIPITATION

(*A. Kuyper, J. Biol. Chem.* **123,** *405, 1938*)

In the presence of calcium ions and phosphate, citric acid can be quantitatively precipitated in alkaline solutions. Calcium must be present in excess of the amount calculated to react with phosphate and citrate. Larger amounts of phosphate are required to precipitate greater quantities of citric acid.

COIN TEST FOR SULFUR OLIVE OILS

(Carbon Bisulfide Extracted)

See "OLIVE OIL"

C-136—COLLODION

(*U.S.P.*)

Free Acid: Add 5 cc of collodion to 5 cc of distilled water: the aqueous liquid separated from the pyroxylin is not acid to litmus.

Assay: Pour quickly about 10 cc of collodion into a tared flask, stopper, weigh accurately, warm it on a water bath, and add 10 cc of distilled water dropwise, with constant stirring. Evaporate the mixture on a water bath, and dry the residue to constant weight at 110° C.

C-137—COPPER

(*U.S.P.*)

Solutions of cupric compounds, acidulated with hydrochloric acid, deposit a red film of metallic copper upon a bright untarnished surface of metallic iron. An excess of ammonia T.S., added to a solution of a cupric salt, produces first a bluish precipitate and then a deep blue-colored solution. With potassium ferrocyanide T.S., solutions of cupric salts yield a red precipitate, insoluble in diluted acids.

C-138—COPPER IONS, SPOT TEST FOR

(*E. A. Kocsis & R. Horvai. Mikrochemie ver. Mikrochim. Acta* **29,** *44-5, 1941*)

As little as 0.25 gamma of Cu^{++} can be estimated by a spot plate test with 0.2 percent aqueous solution of the Na salt of tetrabromophenolphthalein. The solution of the reagent has a violet color and gives with Cu^{++} and Fe^{+++} reddish brown precipitates with Hg^{++} a greenish yellow and with Hg^{+} a yellowish white precipitate that is slow to settle. The Cu test can be obtained in the presence of other ions. (*Thru C. A.* **35,** *5412, 1941.*)

C-139—COTTONSEED OIL

(*A.O.A.C.*)

Halphen Test—Official

Mix CS_2 containing 1 percent of S in solution with an equal volume of amyl alcohol. Mix equal volumes of this reagent and sample under examination and heat in bath of boiling, saturated brine for 1-2 hours. In presence of as little as 1 percent cottonseed oil, a pronounced characteristic red or orange-red color is produced. The depth of color is proportional, to a certain extent, to quantity of cottonseed oil present, and comparative tests with known mixtures of cottonseed oil will give an approximation of quantity.

Different oils react with different intensities. Oils that have been heated to 200-210° react with greatly diminished intensity. Heating for 10 min. at 250° renders cottonseed oil incapable of giving the reaction. The fat of animals fed on cottonseed meal or other cottonseed products may give a positive reaction by this test.

C-140—COTTONSEED OIL

(*U.S.P.*)

SOLUBILITY: Cottonseed oil is slightly soluble in alcohol. It is miscible with ether, chloroform, purified benzin, and with carbon disulfide.

IDENTIFICATION-A: Dilute cottonseed oil with an equal volume of carbon disulfide, and add sulfuric acid (specific gravity 1.6 to 1.7): the mixture rapidly becomes reddish brown in color. B: Mix 2 cc of cottonseed oil in a test tube with 2 cc of a mixture of equal volumes of amyl alcohol and a 1 percent solution of precipitated sulfur in carbon disulfide. Warm the mixture carefully until the carbon disulfide is expelled, and immerse the test tube to one-third of its length in a boiling, saturated aqueous solution of sodium chloride: a red color develops in the mixture within 5 to 15 minutes.

C-141—COUMARIN

(*N.F.*)

Identification: Coumarin dissolves slowly in a solution of sodium or potassium hydroxide, producing a yellow color and forming sodium or potassium coumarinate. The coumarin is precipitated from this solution by the addition of carbondioxide, or by the addition of hydrochloric acid.

Identification: A saturated aqueous solution of coumarin forms a precipitate upon the addition of iodine T.S. The precipitate is at first brown, and flocculent, and afterward coalesces when shaken, forming a dark green, curdy mass, and leaving the supernatant liquid clear (distinction from vanillin).

C-142—DECALIN AND TETRALIN, TEST FOR—CASTIGLIONI

(*Merck Index*)

Mix 1 cc of the liquid with 50 cc 50 percent alcohol, and to 1 cc of the mixture add 1 cc of 30 percent formaldehyde and 10 cc HCl or 2 cc H_2SO_4. If HCl is used, heat to boiling and allow to cool; using H_2SO_4, do not heat. With HCl, as little as 0.05 gram decalin gives an orange color while as much as 0.2 gram tetralin produces a dis-

tinct pink color, whereas 0.1 gram decalin gives a yellow color. If furfural is used instead of formaldehyde, the test is more sensitive, but then both decalin and tetralin give the same color.

C-143—DETERGENTS, ANALYSIS OF

(*K. Linsenmeyer. Melliand Textilber.* **21,** *468-9; thru Chem. Abs.*)

Various wetting agents and detergents can be differentiated from one another qualitatively by a number of tests. For convenience the materials studied were divided into eight classes: (1) soaps, (2) sulfonated oils such as monopole oil, (3) highly sulfonated alcohols such as Avirol, (4) naphthalene sulfo-acids such as Nekal, (5) fatty alcohol sulfates such as Dupanol, (6) fatty acid condensation products such as Igepon, (7) protein fatty acid condensation products such as Lamepon, and 8 ethylene oxide condensation products such as Igepal.

To test these, 2 or 3 drops or an equivalent quantity of solid are dissolved in 1 cc of distilled water.

Test A. Boil with 3 cc of 5 percent acetic acid and also boil a separate sample with 10 cc of water of 20 degrees of hardness. A precipitate indicates sample (1) or (2) above. Extract a sample of the original material with alcohol, filter, and evaporate and ash the filtrate. Sample (2) yields sulfate in the ash.

Test B. Treat with 1 drop of concentrated hydrochloric acid. Samples (3) and (7) show turbidity. Only sample (7) gives the biuret reaction.

Test C. Boil for a minute or two with 5 cc of concentrated hydrochloric acid. Cool and dilute to 10 cc. Samples (4) and (5) show strong turbidity. Only sample (4) gives a precipitate with copper sulfate solution. Samples (6) and (8) are unaffected by the above tests. Sample (6) gives a test for nitrogen and shows sulfate in the ash. Sample (8) yields no ash. Also see C-20.

C-144—DEXTROSUM

(*U.S.P.*)

Add a few drops of an aqueous solution of Dextrose (1 in 20) to 5 cc of hot alkaline cupric tartrate T.S.: a copious red precipitate of cuprous oxide appears.

C-145—DI AND TRI-CALCIUM PHOSPHATE REACTION FOR DIFFERENTIATING—MACCONE

(*Merck Index*)

A mixture of dicalcium phosphate with iodeosine and water becomes colorless when a little dilute HCl is added; with tricalcium phosphate the red color persists.

DIETHANOLAMINE

See Alkanolamines C-29

DIETHYL PHTHALLATE

See Phthallates

DIETHYLSTILBESTROL

See Stilbestrol

DIETHYLENE GLYCOL

See Glycols C-181.

DIETHYLENE GLYCOL MONO-ETHYL ETHER

See Glycols C-180

DIGLYCOL STEARATE

A brand of Diethylene Glycol Stearate.

See Glycol Stearates C-179

DI MAGNESIUM PHOSPHATE

See Magnesium Phosphate

DREFT

Dreft is reputed to be a sodium alkyl sulfate similar to Gardinol, Avirol or Dupanol.

See Gardinol C-166 and Detergents C-143.

C-146—DULCIN AND SACCHARIN IN FOOD PRODUCTS, DETECTION OF

(*F. Th. van Voorst. Chem. Weekblad* **39,** *510, 1942 Chem. Zentr. 1942, II, 2862*)

For solids, extract 5 gm of sample with alcohol, evaporate the alcohol, take up the residue with hot water, filter, acidify with 1 cc of 25 percent H_3PO_4, extract with ether petroleum ether (1 + 1), evaporate and weigh the residue. For liquids, evaporate on a water bath, wash the residue with a small amount of water into the perforator, acidify with H_3PO_4 and treat as above. To detect dulcin, add 1 drop of 65 percent HNO_3 on a mixing rod to a grain of the substance obtained and dissolve it by rubbing, inoculate with a trace of water by means of a needle, and observe the crystal formation (if necessary after purification of the dulcin in solution with activated charcoal). The dichroism between 2 Nicol prisms is especially characteristic for nitrodulcin. To detect saccharin add several particles of the substance to Zwicker reagent (8 gm of crystalline $CuSO_4$ + 100 gm of water + 20 cc of pyridine). This results in the formation of either prismlike crystals or, sometimes, of starlike aggregates that show pronounced dichroism between crossed Nicol's prisms with gypsum plates. (*Thru C. A.* **38,** *2399, 1944.*)

C-147—ESSENTIAL OILS, REACTIONS FOR—DRAGENDORFF

(*Merck Index*)

I. A solution of 1 gm bromine in 20 gms ether colors *anise* oil gradually red; *copaiba* oil, deep blue; *cubeb* oil, gradually blue and bluish-violet; *curled mint* oil, gradually greenish-blue; *clove* oil, yellow-green after a while; *peppermint* oil, violet; *rosemary* oil, gradually greenish; and *juniper* oil, rapidly green. Lemon, caraway, rue, savin, and turpentine oils give no color reactions.

II. Alcoholic HCl colors *anise* oil, green then violet; *lemon* oil, yellow then cherry-red; *copaiba* oil, violet-red; *cubeb* oil, violet and cherry-red; *curled mint* oil, violet to cherry-red; *caraway* oil, gradually deep brown-red with a crystalline precipitation; *clove* oil, brownish; *peppermint* oil, olive-green then violet; *rosemary*, oil red-brown then cherry-red; *savin* oil, pale red and violet; and *juniper* oil, cherry-red.

III. Frohde's Solution (1 gm sodium molybdate in 100 cc concentrated H_2SO_4) colors *anise* oil, yellow-brown; *lemon* oil, dark orange-brown; *copaiba* oil, yellow-brown; *cubeb* oil, gamboge-yellow then currant-red; *curled mint* oil, dark orange then light brown; *caraway* oil, dark yellow and carmine-red; *clove* oil, dark blood-red then cherry-red; *peppermint* oil, brown and then

cherry-red after 24 hours; *rue* oil, yellow-brown; *rosemary* oil, yellow-brown; *savin* oil, yellow-brown; *turpentine* oil, red-brown; and *juniper* oil, brown then cherry-red.

IV. Picric acid dissolves in anise oil easily with an orange-yellow color but in lemon, copaiba, cubeb, turpentine and juniper oils only with the aid of heat; picric acid sometimes dissolves in the resinified oils with a red-brown color. It dissolves in curled mint oil with an olive-green color on warming; in caraway, clove and rosemary oils easily in the cold, and in peppermint oil on heating with a deep green color. On standing with the reagent, rue oil is colored a pink to red which disappears on warming.

V. A mixture of 6 cc concentrated H_2SO_4 and 1 cc 5 percent aqueous ferric chloride colors anise oil, yellow-brown then cherry-red; lemon and turpentine oils, brown with a red margin; copaiba and cubeb oils, finally blue; curled mint oil, yellow-brown then cherry-red; caraway oil, yellow to cherry-red; clove oil, red-brown then blood-red and later blue and cherry-red; savin oil, finally cherry-red; and juniper oil brown then cherry-red.

C-148—ESTER VALUE

(*U.S.P.*)

The ester value is the number of milligrams of potassium hydroxide required to saponify the esters in 1 gm of fatty or volatile oil, fat, wax, resin, balsam, or similar organic substance. If the saponification value and the acid value have been determined, the difference between these two represents the ester value.

To determine the ester value directly, proceed as follows: Shake from 1.5 to 2 gms of the substance, accurately weighed in a 200- to 250-cc tared flask, with from 20 to 30 cc of alcohol, add 1 cc of phenolphthalein T.S., and titrate with half-normal alcoholic potassium hydroxide until the free acid is neutralized. Add exactly 25 cc of half-normal alcoholic potassium hydroxide, and proceed as directed under saponification value, beginning with "insert in the neck of the flask" and omitting the further addition of phenolphthalein T.S. The difference between the number of cc of half-normal hydrochloric acid consumed in the actual test and in the blank multiplied by 28.05 and divided by the weight of the substance taken, gives the ester value.

ESTER GUM

See Rosin

C-149—ESTRADIOL BENZOATE

(*U.S.P.*)

(a) Dissolve 2 mg of Estradiol Benzoate in 2 cc of sulfuric acid; the solution is greenish yellow and exhibits a blue fluorescence. When this solution is diluted with 2 cc of distilled water, the color changes to pale orange. (b) Dissolve 0.1 gm of Estradiol Benzoate in 10 cc of methanol, add 100 mg of potassium carbonate dissolved in 0.5 cc of water, and reflux the mixture on the steam bath for 2 hours. Add 30 cc of water, and heat gently until the alcohol is evaporated. Then add 15 cc of distilled water, and keep the solution at a temperature between 5° and 10° C for an hour. Filter the precipitate, wash it with cold distilled water until the washings are neutral to litmus paper, then dry it at about 80° C. The estradiol so obtained melts between 174° and 179° C. (c) Mix 50 mg of sulfanilic acid with 2 cc of diluted hydrochloric acid, warm the mixture, then cool it in ice water, and slowly add, with agitation, 0.3 cc of an aqueous solution of sodium nitrite (1 in 10).

C-150—ESTROGENS, NATURALLY OCCURRING, NEW COLOR REACTIONS FOR

(*I. S. Kleiner, J. Biol. Chem.* **138,** *783-4, 1941*)

Estrone, estradiol and estriol react with phthalic anhydride and give a substance which dissolves in $CHCl_3$, producing a solution with a brilliant deep pink color and a greenish fluorescence. The color solution has an absorption band at 538.6 mu and the fluorescent band has its maximum at 557 mu. Cholesterol, testosterone, androsterone, dehydroandrosterone and progesterone, none of which possess a phenolic OH group, do not produce this phthalein. Many other substances with a phenolic OH group form phthaleins but none so far tested yields compounds having the properties mentioned. These properties will, it is hoped, afford a means of adapting the test to quantitative procedures. By using appropriate amounts of reagents, as little as 0.252 of estrone may be detected. (*Thru C. A.* **35,** *4036, 1941.*)

C-151—ESTRONE

(*U.S.P.*)

(a) Dissolve 50 mg of estrone in 6 cc of pyridine and 2 cc of acetic anhydride, and heat at 95° C for 24 hours. Add 10 cc of diluted alcohol and evaporate in a vacuum to a thick oil. Add about 1 cc of diluted alcohol and set aside to crystallize. Filter out the crystals and recrystallize twice from hot alcohol: the estrone acetate so obtained melts between 125° and 127° C. (b) Dissolve 50 mg of estrone and 50 mg of hydroxylamine in 10 cc of alcohol, add 1 cc of glacial acetic acid, and boil under a reflux condenser for 5 hours. Add 10 cc of distilled water and recrystallize the precipitate twice from hot alcohol: the estrone oxime so obtained melts between 229° and 231° C.

C-152—ETHYL ACETATE

(*N.F.*)

Identification: Ethyl acetate is readily volatilized even at low temperature and is inflammable; when burned, a yellow flame and an acetous odor are produced.

Residue: Ethyl acetate yields not more than 0.02 percent of residue upon evaporation to constant weight at 100° C.

Carbonizable Impurities: Pour 2 cc of ethyl acetate carefully upon 10 cc of sulfuric acid so as to form separate layers: no dark zone is developed within 15 minutes.

Free Acid: Mix 2 cc of ethyl acetate with 10 cc of neutral alcohol, add 2 drops of phenolphthalein T.S., and titrate with tenth-normal sodium hydroxide: not more than 0.1 cc of tenth-normal sodium hydroxide is required to produce a pink color.

Butyl or Amyl Derivatives: Allow 10 cc of ethyl acetate to evaporate spontaneously from clean, odorless blotting paper: the final odor does not resemble that of pineapple or banana.

Methyl Compounds: Mix 20 cc of ethyl acetate with a

solution of 20 gms of sodium hydroxide in 50 cc of distilled water; allow the mixture to stand, agitating occasionally, or heat it gently under a reflux condenser until a homogeneous liquid results; then distil about 25 cc: this distillate meets the requirements of the test for methanol as given under Spiritus Frumenti, U. S. Pharmacopoeia XII.

Assay: Transfer about 1.5 gms of ethyl acetate, accurately weighed in a tared, stoppered weighing bottle, to a suitable flask; add 50 cc of half-normal sodium hydroxide, and heat on a water bath under a reflux condenser for one hour. Allow it to cool, and titrate the excess sodium hydroxide with half-normal hydrochloric acid using phenalphthalein T.S. as the indicator. Each cc of half-normal sodium hydroxide is equivalent to 0.04405 gm of $CH_3COO.C_2H_5$.

ETHYL AMINOBENZOATE
See Benzocain C-47, 48, 49

ETHYL CELLULOSE
See Plastic Derivatives

ETHYLENE GLYCOL
See Glycols C-178

ETHYL p-HYDROXYBENZOATE
See Parahydroxybenzoate

C-153—DETECTING ADULTERATION OF ETHYLVANILLIN WITH VANILLIN

(*Howard Nechamkin, J. Ind. & Eng. Chem.* **15**, *268, 1943*)

Reagents. 1. Two percent alcoholic solution of potassium hydroxide, to which excess ammonium thiocyanate has been added.

2. A mixture of 1 cc of 7 percent aqueous cupric sulfate pentahydrate, 4 cc of 3 percent alcoholic ferric chloride dodecahydrate, and 5 cc of 95 percent ethyl alcohol.

Procedure. The ethylvanillin-vanillin fraction of the product is extracted with alcohol-free ether, and if not crystalline is purified according to the method of the A. O. A. C. Twenty-five milligrams of the residue, dried in a sulfuric acid desiccator, are placed in a medium-sized test tube. For comparative purposes, 25 mg of pure ethylvanillin may be placed in another test tube and put through the same procedure as the unknown. Three to 4 cc of 95 percent ethanol are added to the solid and the tube is shaken. A drop of reagent 1 and then a drop of reagent 2 are added and the mixture is gently shaken for a minute. In the presence of vanillin a red color is produced, which fades very slightly during several hours. If only ethylvanillin is present, a light yellow color will result from a very rapidly fading reddish solution.

The test tubes used must be perfectly clean and it is advisable to rinse them with alcohol before the test. If a quantitative estimate of the amount of vanillin present is desired, the color produced by the unknown may be compared in the colorimeter with those produced by known mixtures of vanillin and ethylvanillin during the same period of time.

The method has been found to detect the presence of at least 1 mg of vanillin in the specimen taken for analysis. Coumarin does not interfere. Fresh reagents should be prepared after 2 days, since too much water and the tendency of reagent 2 to separate will cause a decrease in the sensitivity of the test. The procedure must be carefully followed, since the addition of too much reagent or of reagent 2 before reagent 1 may lead to erroneous results.

EURESOL
See Resorcinol Monoacetate

C-154—FREE FATTY ACIDS

(*A.O.C.S.*)

Alcohol.—This shall be approximately 95 percent ethyl alcohol, freshly distilled from sodium hydroxide, which with phenolphthalein gives a definite and distinct end point.

Note.—For routine work, methanol or Formula 30 denatured ethyl alcohol of the same strength may be used.

Determination.—Weigh 1 to 15 grams of the prepared sample into an Erlenmeyer flask, using the smaller quantity for dark-colored, high-acid fats. Add 50 to 100 cc hot, neutral alcohol, and titrate with 0.5, 0.25 or 0.1 *N* sodium hydroxide depending on the fatty acid content, using phenolphthalein as indicator. Calculate to oleic acid, except that in the case of palm oil the results may also be expressed in terms of palmitic acid, clearly indicating the two methods of calculation in the report. In the case of coconut and palm kernel oils, calculate to and report in terms of lauric acid in addition to oleic acid, clearly indicating the two methods of calculation in the report. For fats or greases containing more than 0.1 percent of soluble mineral matter, add to the percentage of free fatty acids as determined 10 times the percentage of bases in the soluble mineral matter as determined. This addition gives the equivalent of fatty acids combined with the soluble mineral matter.

The fatty acid method adopted is sufficiently accurate for commercial purposes. In many routine laboratories the fat or oil is measured and not weighed, but the Committee recommends weighing the sample in all cases. For scientific purposes the result is often expressed as "acid number," meaning the number of milligrams of potassium hydroxide required to neutralize the free acids in 1 gram of fat, but in some instances the commercial practice is to express the fatty acids as oleic acid or, in the case of palm oil, as palmitic acid. The Committee sees no objection to the continuation of this custom so long as the analytical report clearly indicates how the free acid is expressed. For a more exact expression of the free acid in a given fat, the Committee recommends that the ratio of acid number to saponification number be used.

This method of expressing results is subject to error when unsaponifiable fatty matter is present, since the result expresses the ratio of free fatty acid to total saponifiable fatty matter present.

C-155—FATTY ACIDS, SEPARATION OF IN VANISHING CREAMS, ETC.

(*Emery Industries, Inc., Method*)

Assuming only oleic, palmitic and stearic acids to be present, the following method for quantitatively determining the amount of those acids present in mixtures such

items as vanishing, hand or brushless shaving creams.

Separate unsaponifiable from saponifiable matter.

Heat the alcoholic soap solution of the saponifiable matter on the steam bath until all the alcohol has been evaporated. Dissolve the soap residue in hot water, acidulate and extract the liberated fatty acids with ethyl ether. Evaporate the ether on the steam bath, dry the fatty acids in a 100°C oven and then weigh. Carefully determine the iodine value and saponification value of the extracted fatty acids. Calculate the amount of oleic, palmitic and stearic acids present by the following formulas:

% Oleic Acid = Iodine Value x 1.11.

% Saturated Acid = 100% Oleic Acid.

Saponification Value due to Oleic Acid = % Oleic Acid x 1.988.

Saponification Value due to Saturated Acids = Saponification Value of Extracted Fatty Acids—Saponification Value due to Oleic Acid.

The percent of palmitic acid can be computed from the following equation:

(218.8 x % Palmitic Acid) + 197.2 [100%—(% Palmitic + % Oleic Acid)] = Saponification Number due to Saturated Fatty Acids.

% Stearic Acid = 100%—(% Oleic Acid + % Palmitic Acid).

By also determining the thiocyanogen value of the fatty acids, the amount of the linoleic acid can be calculated using the method on pages 44b and 44c of the A.O.C.S. Methods.

If it is desired to quantitatively determine and to actually separate the acids from one another it is necessary to carry out the following:

1. Separate the liquid from the solid fatty acids by the Modified Twitchell Method as given on pages 44d, 44e, and 44f of the A.O.C.S. Methods.
2. Separate the liquid or solid fatty acids by either of the following methods:
   A. Fractional distillation of their methyl esters. For details see T. P. Hilditch, Chemical Products **3,** 78, 81, 1940.
   B. Fractional crystallization. For details see:
   J. B. Brown, J. Amer. Chem. Soc., **60,** 2734, 1938.
   J. B. Brown, J. Amer. Chem. Soc., **59,** 3, 1937.
   P. J. Hartsuch, J. Amer. Chem. Soc., **61,** 1142, 1939

C-156—FATTY ACIDS IN LIQUID SOAP-RAPID METHOD

(Soap, p. 55, Aug., 1933)

According to G. Knigge, writing in Allgemeine Oel und Fett Zeitung, the following method has been suggested for analyzing a liquid soap. For this method, weigh into a 100 cc beaker 10 grams of soap, add hot water and acid to decompose, heat until both oil and aqueous layers are clear. A glass rod is placed in the beaker. Add three to four grams of high m.p. paraffin and place the beaker in an oven at a temperature of 75-80°C, without stirring to avoid separation of oil drops, until the wax-fatty acids mixture is quite clear. The beaker is then removed from the oven and allowed to cool. The acid water is removed from underneath the cake, which is washed with water to remove acid. The washed cake is transferred to the small beaker, which is then placed in the oven for the evaporation of the water. Dabbing with a filter paper is not recommended owing to the possibility of loss. Comparison of results obtained by the ether and cake methods is given in the following tabulation:

	Ether method %	Cake method %	Difference
Sample 1	23.31	23.22	0.09
Sample 2	24.72	24.8	0.08
Sample 3	25.02	25.12	0.10
Sample 4	9.18	9.20	0.02
Sample 5	15.03	15.14	0.11

ALCOHOL

To detect the presence of alcohol, the soap is warmed gently with dilute HCl until the fatty acids separate. From the liquid a portion of the aqueous layer is removed by means of a pipet and run into a test tube and a crystal of iodine and a little concentrated KOH is added. The odor of iodoform developed on warming indicates the presence of alcohol. In the quantitative determination, 100 cc of the soap is decomposed with dilute sulfuric acid and two-thirds of the aqueous solution is distilled over. The distillate is placed in a separatory funnel, where the aqueous layer is allowed to settle. This is then run off into a 100 cc measuring flask. The contents are made up to the mark with water and the specific gravity is determined. The alcohol content of the soap can then be read off tables.

C-157—FATTY ACIDS, PREPARATION OF: FOR TITER TEST

(A.O.C.S.)

1. Weigh 110 grams of glycerol caustic into the saponification vessel, stir while heating to 150°C, add 50 ml of melted fat and reheat. In some cases a little additional caustic may be found necessary to insure complete saponification.

2. Continue stirring, being careful not to heat above 150°C, until completely saponified.

3. Cool slightly, add 200-300 ml of water and after the solution of the soap add 50 ml of the sulfuric acid, stirring during the addition. After separation of the fatty acids, more water may be added if desired and boiling continued until the fatty acids are completely melted and clear. If a gas burner is used for heating, the water level should be high enough to prevent scorching on the sides of the dish.

4. The aqueous layer containing the sulfuric acid may be removed from under the fatty acid layer by an appropriate siphon. Again add water and boil two or three minutes, making sure that all of the fatty acids are melted and clear. High melting point fats are sometimes slow to melt and clear. The fatty acid layer should be carefully inspected while it is quiet, to be sure all has melted.

5. Siphon off water again and repeat, if necessary, with water, as under (4) until wash water is neutral to methyl orange.

6. Carefully remove fatty acids so as not to include any water.

Filter these, while entirely melted, through any rapid filtering paper. Heat the filtered acids on a hot plate to 130°C to remove traces of moisture and pour into the test tube. Fill the latter to a height of 57 mm from the bottom. The sample should not be held at 130°C, nor should it be reheated to this temperature more than once. If excessive moisture is present, the acids should be decanted, after having stood for a few minutes, refiltered and reheated. The acids must be thoroughly dry.

NOTES: 1. Saponification is usually indicated by a

solution of 20 gms of sodium hydroxide in 50 cc of distilled water; allow the mixture to stand, agitating occasionally, or heat it gently under a reflux condenser until a homogeneous liquid results; then distil about 25 cc: this distillate meets the requirements of the test for methanol as given under Spiritus Frumenti, U. S. Pharmacopoeia XII.

Assay: Transfer about 1.5 gms of ethyl acetate, accurately weighed in a tared, stoppered weighing bottle, to a suitable flask; add 50 cc of half-normal sodium hydroxide, and heat on a water bath under a reflux condenser for one hour. Allow it to cool, and titrate the excess sodium hydroxide with half-normal hydrochloric acid using phenalphthalein T.S. as the indicator. Each cc of half-normal sodium hydroxide is equivalent to 0.04405 gm of $CH_3COO.C_2H_5$.

ETHYL AMINOBENZOATE
See Benzocain C-47, 48, 49

ETHYL CELLULOSE
See Plastic Derivatives

ETHYLENE GLYCOL
See Glycols C-178

ETHYL p-HYDROXYBENZOATE
See Parahydroxybenzoate

C-153—DETECTING ADULTERATION OF ETHYLVANILLIN WITH VANILLIN

(*Howard Nechamkin, J. Ind. & Eng. Chem.* **15**, *268, 1943*)

Reagents. 1. Two percent alcoholic solution of potassium hydroxide, to which excess ammonium thiocyanate has been added.

2. A mixture of 1 cc of 7 percent aqueous cupric sulfate pentahydrate, 4 cc of 3 percent alcoholic ferric chloride dodecahydrate, and 5 cc of 95 percent ethyl alcohol.

Procedure. The ethylvanillin-vanillin fraction of the product is extracted with alcohol-free ether, and if not crystalline is purified according to the method of the A. O. A. C. Twenty-five milligrams of the residue, dried in a sulfuric acid desiccator, are placed in a medium-sized test tube. For comparative purposes, 25 mg of pure ethylvanillin may be placed in another test tube and put through the same procedure as the unknown. Three to 4 cc of 95 percent ethanol are added to the solid and the tube is shaken. A drop of reagent 1 and then a drop of reagent 2 are added and the mixture is gently shaken for a minute. In the presence of vanillin a red color is produced, which fades very slightly during several hours. If only ethylvanillin is present, a light yellow color will result from a very rapidly fading reddish solution.

The test tubes used must be perfectly clean and it is advisable to rinse them with alcohol before the test. If a quantitative estimate of the amount of vanillin present is desired, the color produced by the unknown may be compared in the colorimeter with those produced by known mixtures of vanillin and ethylvanillin during the same period of time.

The method has been found to detect the presence of at least 1 mg of vanillin in the specimen taken for analysis. Coumarin does not interfere. Fresh reagents should be prepared after 2 days, since too much water and the tendency of reagent 2 to separate will cause a decrease in the sensitivity of the test. The procedure must be carefully followed, since the addition of too much reagent or of reagent 2 before reagent 1 may lead to erroneous results.

EURESOL
See Resorcinol Monoacetate

C-154—FREE FATTY ACIDS

(*A.O.C.S.*)

Alcohol.—This shall be approximately 95 percent ethyl alcohol, freshly distilled from sodium hydroxide, which with phenolphthalein gives a definite and distinct end point.

Note.—For routine work, methanol or Formula 30 denatured ethyl alcohol of the same strength may be used.

Determination.—Weigh 1 to 15 grams of the prepared sample into an Erlenmeyer flask, using the smaller quantity for dark-colored, high-acid fats. Add 50 to 100 cc hot, neutral alcohol, and titrate with 0.5, 0.25 or 0.1 *N* sodium hydroxide depending on the fatty acid content, using phenolphthalein as indicator. Calculate to oleic acid, except that in the case of palm oil the results may also be expressed in terms of palmitic acid, clearly indicating the two methods of calculation in the report. In the case of coconut and palm kernel oils, calculate to and report in terms of lauric acid in addition to oleic acid, clearly indicating the two methods of calculation in the report. For fats or greases containing more than 0.1 percent of soluble mineral matter, add to the percentage of free fatty acids as determined 10 times the percentage of bases in the soluble mineral matter as determined. This addition gives the equivalent of fatty acids combined with the soluble mineral matter.

The fatty acid method adopted is sufficiently accurate for commercial purposes. In many routine laboratories the fat or oil is measured and not weighed, but the Committee recommends weighing the sample in all cases. For scientific purposes the result is often expressed as "acid number," meaning the number of milligrams of potassium hydroxide required to neutralize the free acids in 1 gram of fat, but in some instances the commercial practice is to express the fatty acids as oleic acid or, in the case of palm oil, as palmitic acid. The Committee sees no objection to the continuation of this custom so long as the analytical report clearly indicates how the free acid is expressed. For a more exact expression of the free acid in a given fat, the Committee recommends that the ratio of acid number to saponification number be used.

This method of expressing results is subject to error when unsaponifiable fatty matter is present, since the result expresses the ratio of free fatty acid to total saponifiable fatty matter present.

C-155—FATTY ACIDS, SEPARATION OF IN VANISHING CREAMS, ETC.

(*Emery Industries, Inc., Method*)

Assuming only oleic, palmitic and stearic acids to be present, the following method for quantitatively determining the amount of those acids present in mixtures such

items as vanishing, hand or brushless shaving creams.

Separate unsaponifiable from saponifiable matter.

Heat the alcoholic soap solution of the saponifiable matter on the steam bath until all the alcohol has been evaporated. Dissolve the soap residue in hot water, acidulate and extract the liberated fatty acids with ethyl ether. Evaporate the ether on the steam bath, dry the fatty acids in a 100°C oven and then weigh. Carefully determine the iodine value and saponification value of the extracted fatty acids. Calculate the amount of oleic, palmitic and stearic acids present by the following formulas:

% Oleic Acid = Iodine Value x 1.11.

% Saturated Acid = 100% Oleic Acid.

Saponification Value due to Oleic Acid = % Oleic Acid x 1.988.

Saponification Value due to Saturated Acids = Saponification Value of Extracted Fatty Acids—Saponification Value due to Oleic Acid.

The percent of palmitic acid can be computed from the following equation:

(218.8 x % Palmitic Acid) + 197.2 [100%—(% Palmitic + % Oleic Acid)] = Saponification Number due to Saturated Fatty Acids.

% Stearic Acid = 100%—(% Oleic Acid + % Palmitic Acid).

By also determining the thiocyanogen value of the fatty acids, the amount of the linoleic acid can be calculated using the method on pages 44b and 44c of the A.O.C.S. Methods.

If it is desired to quantitatively determine and to actually separate the acids from one another it is necessary to carry out the following:

1. Separate the liquid from the solid fatty acids by the Modified Twitchell Method as given on pages 44d, 44e, and 44f of the A.O.C.S. Methods.
2. Separate the liquid or solid fatty acids by either of the following methods:
   - A. Fractional distillation of their methyl esters. For details see T. P. Hilditch, Chemical Products **3,** 78, 81, 1940.
   - B. Fractional crystallization. For details see:
     J. B. Brown, J. Amer. Chem. Soc., **60,** 2734, 1938.
     J. B. Brown, J. Amer. Chem. Soc., **59,** 3, 1937.
     P. J. Hartsuch, J. Amer. Chem. Soc., **61,** 1142, 1939

C-156—FATTY ACIDS IN LIQUID SOAP-RAPID METHOD

(Soap, p. 55, Aug., 1933)

According to G. Knigge, writing in Allgemeine Oel und Fett Zeitung, the following method has been suggested for analyzing a liquid soap. For this method, weigh into a 100 cc beaker 10 grams of soap, add hot water and acid to decompose, heat until both oil and aqueous layers are clear. A glass rod is placed in the beaker. Add three to four grams of high m.p. paraffin and place the beaker in an oven at a temperature of 75-80°C, without stirring to avoid separation of oil drops, until the wax-fatty acids mixture is quite clear. The beaker is then removed from the oven and allowed to cool. The acid water is removed from underneath the cake, which is washed with water to remove acid. The washed cake is transferred to the small beaker, which is then placed in the oven for the evaporation of the water. Dabbing with a filter paper is not recommended owing to the possibility of loss. Comparison of results obtained by the ether and cake methods is given in the following tabulation:

	Ether method %	Cake method %	Difference
Sample 1	23.31	23.22	0.09
Sample 2	24.72	24.8	0.08
Sample 3	25.02	25.12	0.10
Sample 4	9.18	9.20	0.02
Sample 5	15.03	15.14	0.11

ALCOHOL

To detect the presence of alcohol, the soap is warmed gently with dilute HCl until the fatty acids separate. From the liquid a portion of the aqueous layer is removed by means of a pipet and run into a test tube and a crystal of iodine and a little concentrated KOH is added. The odor of iodoform developed on warming indicates the presence of alcohol. In the quantitative determination, 100 cc of the soap is decomposed with dilute sulfuric acid and two-thirds of the aqueous solution is distilled over. The distillate is placed in a separatory funnel, where the aqueous layer is allowed to settle. This is then run off into a 100 cc measuring flask. The contents are made up to the mark with water and the specific gravity is determined. The alcohol content of the soap can then be read off tables.

C-157—FATTY ACIDS, PREPARATION OF: FOR TITER TEST

(A.O.C.S.)

1. Weigh 110 grams of glycerol caustic into the saponification vessel, stir while heating to 150°C, add 50 ml of melted fat and reheat. In some cases a little additional caustic may be found necessary to insure complete saponification.

2. Continue stirring, being careful not to heat above 150°C, until completely saponified.

3. Cool slightly, add 200-300 ml of water and after the solution of the soap add 50 ml of the sulfuric acid, stirring during the addition. After separation of the fatty acids, more water may be added if desired and boiling continued until the fatty acids are completely melted and clear. If a gas burner is used for heating, the water level should be high enough to prevent scorching on the sides of the dish.

4. The aqueous layer containing the sulfuric acid may be removed from under the fatty acid layer by an appropriate siphon. Again add water and boil two or three minutes, making sure that all of the fatty acids are melted and clear. High melting point fats are sometimes slow to melt and clear. The fatty acid layer should be carefully inspected while it is quiet, to be sure all has melted.

5. Siphon off water again and repeat, if necessary, with water, as under (4) until wash water is neutral to methyl orange.

6. Carefully remove fatty acids so as not to include any water.

Filter these, while entirely melted, through any rapid filtering paper. Heat the filtered acids on a hot plate to 130°C to remove traces of moisture and pour into the test tube. Fill the latter to a height of 57 mm from the bottom. The sample should not be held at 130°C, nor should it be reheated to this temperature more than once. If excessive moisture is present, the acids should be decanted, after having stood for a few minutes, refiltered and reheated. The acids must be thoroughly dry.

NOTES: 1. Saponification is usually indicated by a

change in the appearance of the mass which finally becomes homogeneous. Frequently saponification is indicated by a thickening or increase in the viscosity of the mass, which again thins out after the reaction is complete. Also, soap bubbles begin to form and rise from the sample after the reaction is complete. Familiarity with the test and the change which takes place during saponification usually enables one to determine the proper end point. Attention should be called to the fact that, under some abnormal conditions, the above mentioned conditions may not be reliable so that considerable care should be exercised to insure complete saponification. The committee has investigated a number of proposed tests for complete saponification, but up to the present time, none has been found which is reliable under all circumstances.

2. Caustic soda cannot be substituted for caustic potash in the glycerol method. This method is quick and satisfactory. If an alternate method of preparing the fatty acids is desired, the following may be used:

Saponify 50 grams of fat with 60 ml of a solution of 2 parts of methanol to 1 part of 50 percent sodium hydroxide. Dry, pulverize and dissolve the soap in 1000 ml of water in a porcelain dish and then decompose with 25 ml of 75 percent sulfuric acid. Boil the fatty acids until clear oil is formed and then collect and settle in a 150 ml beaker and filter into a 50 ml beaker. Heat to 130°C as rapidly as possible with stirring and transfer, after cooling somewhat, to the usual 2.5 x 10 cm titer tube. The method of taking the titer, including handling and thermometer, is the same as that described in the standard method.

C-158—FATTY ACIDS, VOLUMETRIC ANALYSIS

(Woburn Chemical Company)

At present, two well-known instruments are used; i.e., the Stiepel Analyzer and the Luering Burette, the latter being superior, as better results are obtained with greater

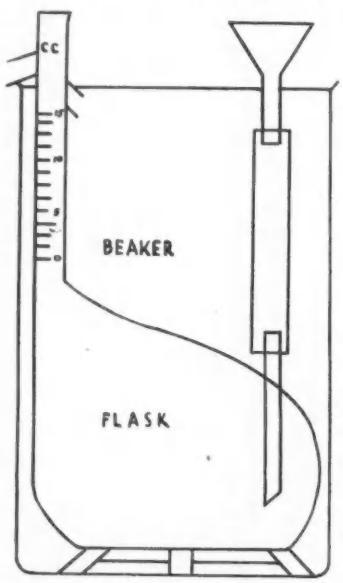

Figure 125. Woburn Fatty Acid Burette

ease in manipulation. The Luering Burette has been modified for use of the practical chemist, the result being the Woburn Fatty Acid Burette.

Other scientific methods are known which may give more accurate results, but they involve many complicated procedures and are not adaptable to quick factory control work. The determination of the fatty acid content in cocoanut soaps gives incorrect results if determined by the usual way of splitting with acid, extracting with petroleum ether and drying to constant weight at 60°C.

The Woburn Fatty Acid Burette gives accurate results and is very simple to operate.

Procedure: If the total fatty acid of a soap solution is to be determined, weigh accurately 400 gm of the solution containing a maximum of 2.5 percent actual soap (of more concentrated soap solutions use correspondingly less and dilute with hot water) into the flask, add a few pieces of unglazed porcelain boiling stone, and 10 cc concentrated hydrochloric acid. Bring to a boil on a hot plate and heat until the soap is split. Remove the flask from the hot plate and add cautiously through the thistle tube enough hot water to bring the lower layer of the fatty acid to the zero mark of the burette. Place the flask in the large Pyrex jar containing boiling water, the burette being immersed as far as possible. When the contents of the flask and burette have reached the temperature of the boiling water in the jar which, meanwhile has been placed on the hot plate, readings are taken at the upper and lower levels of the fatty acid in the burette.

Calculation of Results: If the readings taken on the burette is 11.9 cc and the specific gravity of the fatty acid from which the soap was made is 0.839 (at 99°C) then 11.9 x 0.839 = 9.984 gm fatty acid. To convert the fatty acid into a sodium soap, multiply by 1.078 and for a potassium soap multiply by 1.135. Assuming that a sodium soap was analyzed, we multiply 9.984 x 1.078 = 10.76 gm soap in the 400 gm soap solution used for analysis, and

$$\frac{10.76}{400.00} = 2.69 \text{ percent actual soap in the solution.}$$

The specific gravity of the following acids has been determined by Luering at 99°C:

Linseed Fatty Acids	.8612
Peanut Fatty Acids	.8460
Palm Fatty Acids	.8369
Cocoanut Fatty Acids	.8354
Tallow Fatty Acids	.8348
Lard Fatty Acids	.8445
Palm Kernel Fatty Acids	.8550
Cotton Fatty Acids	.8467

In order to keep the instrument ready for use, empty the burette by adding more hot water (catch the liquid fatty acids in a separate glass if determination of Acid Number, Iodine Number and unsaponifiables, etc., is wanted). Then rinse thoroughly with hot water and some soda ash, and finally with distilled water or alcohol, and hang up for drying.

If the fat is impure the soap solution may be shaken first in a separatory funnel with petroleum ether to remove all unsaponifiables therefrom. Then the soap solution is heated with acid in the Woburn Burette and the fatty acid gathered as above.

Note: The apparatus, beaker and boiling stones can be obtained from the Scientific Glass Apparatus Company, Bloomfield, New Jersey.

C-159—FATTY ACIDS IN SOAP, RAPID DETERMINATION OF

(S. Semenov and M. Zaliopo. Masloboino Zhirovoe Delo **16,** *No. 2, 22-3, 1940)*

The method is based on the neutralization with NaOH and Na_2CO_3 and decomposition of Na salts of fatty acids by titration with HCl in the presence of kerosene and the determination of organic acids in the solution by titration with NaOH. The hydrolysis of soap is prevented by adding neutral 96 percent alcohol. Kerosene is freed from any organic acids by shaking with NaOH and washing to a neutral reaction. Dissolve 5 gms soap in 40-50 ml H_2O, add to the hot solution 15 ml kerosene and 2-3 drops of 0.02 percent methyl orange and titrate, with vigorous shaking, with 0.5 *N* HCl. Introduce 90 ml alcohol and 15-16 drops of 1 percent phenolphthalein and titrate with 0.5 *N* NaOH as above. *(Thru C. A.* **34,** *7129 1940.)*

C-160—FATTY ALCOHOLS IN SULFONATED PRODUCTS, ANALYSIS OF

(K. Linder, A. Russe, & A. Beyer, Soap. Perf. & Cosm. July, p. 10, 1934)

In most sulfonated fatty alcohols in addition to sulfuric acid esters there are traces of sulfo-acids. If their amount does not exceed 2 percent, the following method of analysis may be used.

Five-seven grams of the sulfonated alcohol are dissolved in 25 cc of warm water and heated with 50 cc of hydrochloric acid for one hour over the reflux condenser. After cooling, the solution is transferred with water and petroleum ether into a separating funnel. On separating, the acid water is drawn off and again extracted and the purified extract is washed free of acid. The petroleum ether solution is filtered, evaporated, and the residue dried till the ether odor had disappeared. In the case of coconut fatty alcohols, special precautions are necessary. In separating the sulfo-acids from the fatty alcohols the washed extracts are heated with 50 cc of hot 70 percent alcohol containing a few drops of NaOH T.S. At the final extraction the alcohol should be colorless. The various alcoholic extracts are now mixed with the acid solutions and the wash waters, petroleum ether present driven off, the mixture neutralized after cooling. A few drops of concentrated hydrochloric acid are added, and the acidulated mass is now evaporated to dryness. Any sulfo-acids present are extracted with hot 90 percent alcohol. After filtering, drying at 80°, treating repeatedly with hot alcohol, cooled, residual salts again filtered, the residue is dried at 80° to constant weight, and weighed. It is again weighed after ashing, and the difference shows the approximate content of pure sulfo-acids.

C-161—FATTY ALCOHOLS, SULFATED

(F. M. Biffen and F. D. Snell, Ind. & Eng. Chem., Anal. Ed. **7,** *234-7, 1935)*

Organic Sulfate by Benzidine Method.—Transfer an amount of dry sample or sample solution to contain 0.025 to 0.5 grams of sodium alkyl sulfate to a 250 cc flask. Dissolve in water and dilute to about 25 cc. Neutralize if necessary. Add 10 cc of 0.05 *N* benzidine hydrochloride solution, or if necessary, 20 cc. Shake until the precipitate

AVERAGE FATTY ACID COMPOSITION AND CONSTANTS OF FATS AND OILS

	CHEMICAL FORMULA	COCONUT	PALM KERNEL	TALLOW (beef)	LARD	PALM	OLIVE	COTTONSEED	CORN	PEANUT	SOYBEAN	SUNFLOWER	LINSEED	PERILLA	CASTOR	TUNG	WHALE	MENHADEN	SARDINE	HERRING
SATURATED ACIDS																				
CAPROIC	$C_6H_{12}O_2$	0.2	Trace																	
CAPRYLIC	$C_8H_{16}O_2$	8.0	3.0																	
CAPRIC	$C_{10}H_{20}O_2$	7.0	6.0																	
LAURIC	$C_{12}H_{24}O_2$	48.0	50.0																	
MYRISTIC	$C_{14}H_{28}O_2$	17.5	15.0	2.0	1.0	1.0	Trace	0.5									8.0	7.0	5.0	7.0
PALMITIC	$C_{16}H_{32}O_2$	8.8	7.5	30.0	26.0	42.5	9.0	21.0	7.5	7.0	6.5	3.5	5.0	7.5		4.0	11.0	16.0	14.0	8.0
STEARIC	$C_{18}H_{36}O_2$	2.0	1.5	21.0	11.5	4.0	2.3	2.0	3.5	5.0	4.5	3.0	3.5	Trace	2.0	1.5	2.5	1.0	3.0	Trace
ARACHIDIC	$C_{20}H_{40}O_2$						0.2	Trace	0.5	4.0	0.7	0.6	Trace							
BEHENIC	$C_{22}H_{44}O_2$																			
LIGNOCERIC	$C_{24}H_{48}O_2$					Trace			0.2	3.0	Trace	0.4								
UNSATURATED ACIDS																				
MYRISTOLEIC	$C_{14}H_{28}O_2$																1.5	Trace	Trace	Trace
PALMITOLEIC	$C_{16}H_{30}O_2$																17.0	17.0	12.0	18.0
OLEIC	$C_{18}H_{34}O_2$	6.0	16.0	45.0	58.0	43.0	82.5	33.0	46.3	60.0	33.5	34.0	5.0	8.0	8.6	15.0	34.0	27.0	10.0	9.0
LINOLEIC	$C_{18}H_{32}O_2$	2.5	1.0	2.0	3.5	9.5	6.0	43.5	42.0	21.0	52.5	58.5	61.5	38.0	3.5		9.0	Trace	15.0	13.0
LINOLENIC	$C_{18}H_{30}O_2$										2.3		25.0	46.5			Trace			
ELAEOSTEARIC	$C_{18}H_{30}O_2$															79.5				
RICINOLEIC	$C_{18}H_{34}O_3$														85.9					
C_{20} UNSATURATED	$C_{20}H_{(38-42)}O_2$																5.0	20.0	22.0	20.0
C_{22} UNSATURATED	$C_{22}H_{(42-46)}O_2$																12.0	12.0	19.0	25.0
CONSTANTS																				
SAPONIFICATION VALUE		251-264	240-250	196-200	196-200	195-206	185-200	192-200	188-193	185-192	189-194	189-194	189-196	188-197	175-183	189-195	185-195	189-193	189-193	179-194
IODINE NUMBER		8-10	16-23	35-44	50-69	48-58	74-94	100-115	116-130	83-95	124-148	120-136	179-204	195-208	82-86	160-170	110-136	148-185	170-190	130-144
TITER—°C		20-23°	20-25°	37-46°	36-43°	38-47°	18-25°	32-38°	18-20°	28-32°	20-21°	17-20°	19-21°	12-17°	—	37-38°	22-24°	31-33°	28-34°	23-27°

Courtesy— ARMOUR AND COMPANY

flocculates well and let stand for 10 minutes. Filter through paper and wash the flask and filter three times with 10 cc portions of distilled water. A trace of residue adhering to the flask need not be quantitatively washed out. Wash the precipitate on the filter three times and let it drain well. Drain the water from the stem of the funnel and discard the filtrate.

Wash the precipitate on the filter with hot alcohol into the original flask until about 50 cc of filtrate are obtained. Add 3 to 4 drops of 0.04 percent of bromocresol purple in alcohol. Heat on a water bath to slight boiling. Titrate the hot solution with 0.01 *N* sodium hydroxide solution to a yellow end point. Correct for a blank, obtained by washing a similar paper with hot alcohol and similar titration to the same end point. Calculate the titration to the sodium alkyl sulfate, using the factor corresponding to the alkyl group present or the empirical factor for the mixture present.

Organic Sulfate by Hart-Grimshaw Method. Add 50 cc of 0.5 *N* hydrochloric acid to a solution containing 2 grams of alkyl sulfate, previously exactly neutralized to methyl orange with 0.5 *N* hydrochloric acid. Heat in a water bath for 2 hours using a reflux condenser. The solution gradually becomes cloudy, and finally the fatty alcohol separates out on top, leaving the water layer clear. It is necessary to use a water bath. If direct heating is used, violent bumping occurs even in the presence of glass beads. Wash down the condenser, add 30 grams of sulfate-free sodium chloride, cool, and add 20 cc of ether to dissolve the separated alcohol. Titrate the aqueous layer with 0.5 *N* sodium hydroxide solution to a methyl orange end point.

The values by the benzidine method serve as a basis for comparison, since the method is concise and straightforward. Its applicability depends on the selection of a proper conversion factor. The lauryl radical was assumed here for purposes of calculation. The method is not applicable in the presence of soap or sulfonated oil.

Organic sulfate determinations by the Hart-Grimshaw method give values which should be accurate in the presence of soap but in the absence of sulfonated oil.

C-162—FLAME TEST

Moisten with HCl and pick up a bit on a Platinum loop. Place in outer edge of Bunsen flame and note color developed.

Yellow= Na
Violet= K
Red= Ca, Sr or Li
Green= Cu, Ba & Boric Acid

FLAX SEED
See Linseed

C-163—FORMALDEHYDE, DETERMINATION—HEIM

Extract original solution two times, with a mixture of petroleum ether 2 and ether 1; use half as much solvent extractive as sample; to 10 ml of extracted sample add 100 ml of 0.1 *M* silver nitrate, 1 ml hydrochloric acid and 3 ml 25 percent sodium hydroxide in rapid succession. Filter, wash free from chloride; dissolve reduced silver in warm 1:3 nitric acid and titrate with *N*/10 ammonium thiocyanate solution with ferric alum indicator.

FRUCTOSE
See Levulose

C-164—FUMARIC ACID, REACTION FOR—DELFF

(*Merck Index*)

Aqueous solutions of the acid that are not too dilute produce precipitates of lustrous leaflets when warmed with cadmium sulfate.

C-165—FUSION—CHARCOAL BLOCK TEST

Make a cavity on a piece of charcoal and place a small amount of the questionable substance. Heat in the reducing flame of the blowpipe.

1) If the substance crackles and bursts into flame—nitrates, chlorates and other oxidizing agents.
2) If it melts and is absorbed into the charcoal, the product consists of alkali metal compounds.
3) If it melts and becomes white hot, wet with cobalt nitrate T.S. No color change in presence of Ba, Sr and Ca. If blue, it is aluminum; green, is zinc; pink, is magnesium.
4) If a crust forms and an odor of garlic, it denotes arsenic. If yellow when hot, white when cold, zinc or tin. If it is yellow when hot and cold, it is Pb or Bi. If dark red, it is Ag.

Repeat using a mixture of Na_2CO_3 and sample.

Metallic globules or particles are produced by Ag, Pt, Sn, Sb, Bi, Au, Cu, Fe, Ni and Co when so fused on a charcoal block.

C-166—GARDINOL AND BRILLIANT AVIROL

(*C. J. Pedersen, J. Am. Dyestuff Reptr.*, **24**, *No. 3, 1935*)

Soaps and the following ions do not interfere with the determination: ammonium, sodium, potassium, calcium, barium, magnesium, zinc, aluminum and iron; carbonate, silicate, borate, phosphate, sulfate, sulfite, chloride, nitrate and acetate.

Other sulfated and sulfonated textile assistants, such as Turkey-red oil, Alkanol B and Neomerpin SA, also form water insoluble precipitates with the reagent. They can be quantitatively estimated, therefore, by this method but they cannot be distinguished from Gardinol and Brilliant Avirol products.

Gardinol and Brilliant Avirol products, (sodium alkyl sulfates), however, can be specifically determined as follows: a 10 gram sample of the dry product, or an equivalent quantity of a less concentrated product, is dissolved in 200 cc of water, 100 cc of concentrated hydrochloric acid added, and the solution refluxed for 3 hours in a Kjeldahl flask. The alcohols resulting from the hydrolysis of fatty alcohol sulfates are extracted with ether and quantitatively determined gravimetrically. The hydroxyl number of the alcohols is then obtained by methods found in any comprehensive text book on quantitative organic analysis. Hydroxy fatty acids interfere with the determination, but they can easily be distinguished from alcohols.

Reagent

The reagent is a saturated aqueous solution of purified 1-amino-5-ethoxybenzothiazole hydrochloride. The compound is purified as follows: the crude hydrochloride is dissolved in hot water, a clarifying char added and the solution filtered. The free base is precipitated with ammonium hydroxide, filtered and washed with water. The

press cake is dissolved in dilute hydrochloric acid, and the solid hydrochloride is obtained by adding concentrated hydrochloric acid and chilling in ice water. The purified compound is then filtered off and dried in a vacuum oven at 60°C.

Turbidity Standards

Apparent turbidity depends upon the size of the suspended particles, which in turn is influenced by the physical conditions under which the particles are formed and by the chemical composition of the solution. It is necessary, therefore, that the standards be prepared by adding known quantities of the fatty alcohol sulfates to be estimated to portions of the particular solution formula in use, and carrying these portions through the entire analytical procedure.

It was found that small differences in turbidity can be judged most readily in solutions containing between 0.1 and 0.01 percent fatty alcohol sulfates. For the analysis of a solution whose composition is not even approximately known, it is suggested that standards be prepared at 0.01, 0.02, 0.06, 0.08 and 0.1 percent concentrations. The unknown solution, if too concentrated, must be adjusted by means of measured dilution to fall between these limits.

Analytical Procedure

Filter 100 cc of the solution to be tested into a clean glass container similar in size, shape and color to those in which the standards are kept. Make the clear filtrate just acid to Congo Red test paper with concentrated hydrochloric acid, place it in a shallow pan of running cold water, and filter again if it becomes cloudy. When the temperature of the filtrate has become constant add 3 cc of the reagent, shake and return it to the pan. After 5 minutes compare the turbidity developed with the standards which have also been cooled in the running water.

C-167—GELATIN

(U.S.P.)

Solubility: Gelatin is insoluble in cold water, but swells and softens when immersed in it, gradually absorbing from 5 to 10 times its own weight of water. It is soluble in hot water, in acetic acid, and in a hot mixture of glycerin and water. It is insoluble in alcohol, in chloroform, in ether, and in fixed and volatile oils.

Identification: An aqueous solution of gelatin (1 in 100) yields a precipitate with an aqueous solution of chromium trioxide, and with trinitrophenol T.S.

An aqueous solution of gelatin (1 in 5000) is at once rendered turbid by the addition of tannic acid T.S.

C-168—GELATIN, REACTIONS FOR—SCHMIDT

(Merck Index)

I. Ammonium molybdate solution produces a white flocculent precipitate with a gelatin solution. The precipitate dissolves partially on warming and reappears on cooling.

II. Acidify Nessler's ammonia reagent with H_2SO_4 and filter. With gelatin solutions this reagent produces a white precipitate which dissolves in alkalis.

C-169—GELATIN AND ISINGLASS, TEST FOR—HENZOLD

(Merck Index)

Fruit jellies in which gelatin is suspected are boiled with water, the hot liquid filtered, and a portion of the filtrate is mixed with an excess of 1:10 potassium dichromate solution. The mixture is again heated to boiling, then rapidly cooled and mixed with 2-3 drops of H_2SO_4. Gelatin gives a white, finely divided precipitate which becomes sticky after some time; vegetable jellies such as agar-agar, Iceland moss, etc., give no precipitate.

C-170—GLUCOSE, TEST FOR—CAMPANI

(Merck Index)

The reagent is a mixture of concentrated lead acetate solution and a dilute solution of cupric acetate.

Add the solution to be tested to about 5 cc of this reagent and boil. If glucose is present, a yellow color and a yellow precipitate form. The reagent is indifferent to cane sugar.

(See also Invert Sugar C-198.)

C-171—GLUCOSE, TEST FOR—CHAVASSIEU-MOREL

(Merck Index)

Dissolve 1 gm m-dinitrobenzene in 100 cc alcohol and add 100 cc 33 percent NaOH. To 20 cc of this reagent, add 1 cc of the liquid to be tested. If glucose is present, a violet color develops after a while. Maltose, lactose, levulose, gelactose and arabinose also give this reaction after a longer or shorter time; sucrose does not give the reaction.

C-172—GLYCERIN

(A.A.T.C.C. Method)
Acetin Method

Heat 1.0 to 1.5 grams of glycerin, 3 grams of anhydrous sodium acetate and 7 ml of acetic anhydride in a reflux apparatus for 1½ hrs., then cool and add 50 ml of water slowly through the condenser tube. Warm the solution until the oily deposit dissolves, then filter and wash. The filtrate when cold is just neutralized with $N/2$ caustic soda solution using phenolphthalein as an indicator. This operation is done slowly with constant agitation to avoid a local excess of caustic. Add 25 ml of a 10 percent pure caustic soda solution from a pipette and boil the mixture for 15 minutes. Then titrate the excess of alkali with $N/1$ HCl. Meanwhile 25 ml of the same 10 percent soda solution is also titrated with $N/1$ HCl. The difference in these two titrations is calculated to glycerin.

1 ml $N/1$ HCl = 0.03069 gram glycerin.

Alternative Periodate Method

Weigh accurately about 5 grams of glycerin and dilute to one liter in a volumetric flask. Pipette a 25 ml aliquot into a 250 ml beaker and add 100 ml of cold water. Make the solution neutral to methyl red, then add 1 gram of potassium periodate, stir continuously for 5 minutes and intermittently for 15 minutes more. A certain amount of the periodate will remain undissolved in the solution and 1 mole of formic acid is formed for every mole of glycerin. Titrate the liberated formic acid with $N/10$ NaOH, using Methyl Red as the indicate. Calculate as glycerin.

1 ml $N/10$ NaOH = 0.009206 gram glycerin.

C-173—GLYCERIN, EFFECT OF, ON DISTILLATION METHOD FOR WATER

(*Ralf B. Trusler, Ind. Eng., Anal. Ed.*, **12,** *509, 1940.*)

The determination of water in soaps by the distillation method is affected by the presence of glycerol. The error is negligible when benzene or toluene is the distillation medium, but appreciable when xylene is used.

When xylene is used instead of toluene for distilling out the water content of soap containing glycerol, the additive error in the amount of water found may exceed 1 percent. A larger error will be observed in the analysis of soaps derived from the fatty oils of the coconut oil type than the analysis of other soaps made from longer-chain fatty acids. This is due to the larger yield of glycerol from the former type of oils. Toluene and xylene give identical results upon glycerol-free soaps. In order to obtain universal accuracy in ascertaining anhydrous soap, the distillation test for moisture should be made with toluene. The commercial variety is recommended.

C-174—GLYCERIN

Transfer 50 cc of water-extractive to a 600 cc beaker. Dilute to 150 cc, add 5 gm KOH, and 45 cc of 5 percent potassium permanganate solution. Let stand one-half hour, and then decolorize the excess permanganate with hydrogen peroxide. Make the mixture up to 500 cc in a volumetric flask and filter the supernatant liquid, collecting 250 cc in a volumetric flask of that size. Transfer the filtered portion to a 600 cc beaker, boil one hour to destroy the excess peroxide. Add 10 cc sulfuric acid and titrate rapidly with $N/10$ $KMnO_4$ until one drop causes a pink coloration persisting for 15 seconds. Keep the sample at 80°C. by means of an electric hot-plate.

C-175—GLYCERIN IN THE PRESENCE OF PENTOSES, DETERMINATION OF

(*R. P. Mull. Arch. Biochem.* **2,** *425-8, 1943*)

The determination of glycerin (I) in the presence of d-xylose (II) consists of a $Ce(SO_4)_2$ oxidation of both I and II with a subsequent determination of II by a copper titration method. The amount of I present is then calculated. (*Thru C. A.* **38,** *37, 1944.*)

C-176—GLYCERIN

(*U.S.P.*)

Heat in a test tube a few drops of glycerin with about 0.5 gm of potassium bisulfate; pungent vapors of acrolein are evolved.

C-177—GLYCERIN IN SKIN CREAMS

(*H. D. Murray, J. Soc. Chem. Ind.* **51,** *No. 50, 393-T, 394-T, 1932*)

The method adopted is a modification of that suggested by Benedikt and Zsigmondy; 5 gm of the fat (cream) are weighed into a flask, 100 cc of water are added, and the whole is warmed to melt the fat. The mixture is well shaken and kept warm till the fat has separated. It is then cooled and the oily layer broken. The water is decanted through a filter into a litre flask, and the extraction repeated with two further quantities of 100 cc of water. To the combined filtrates 10 gm of potassium hydroxide are added, the whole is cooled, and just enough 5 percent potassium permanganate solution is added to make the solution pink. It is set aside for half an hour and, if still pink, enough hydrogen peroxide solution is added to precipitate all the permanganate and to remove all trace of pink from the solution. The precipitate is collected and washed. The filtrate is boiled for half an hour, cooled, acidified with sulfuric acid, transferred to a standard flask, and made up to 1000 cc; 250 cc are removed, and titrated with 0.1 N permanganate solution (1 cc of 0.1 N-KM_nO_4 = 0.0046 gm of glycerin).

The results obtained by this method for added glycerin are often high owing to the fact that natural fats and waxes contain small quantities of glycerin or of substances capable of behaving as glycerin. The amount of these substances in the fats likely to be met with seldom exceeds 1.0 percent in the fresh state. An allowance must be made for this fact in determining the percentage of added glycerin. Some figures obtained by this method for the apparent amount of glycerin in certain waxes are as follows: wool wax 1.12 percent, beeswax 0.92 percent, cocoa butter 0.86 percent, spermaceti 0.40 percent.

C-178—GLYCERIN, ETHYLENE GLYCOL, PROPYLENE GLYCOL, DETERMINATION OF

(*I. S. Shupe, J. Assoc. Agr. Chem.* **26,** *249, 1943*)

Analytical applications of the periodate reactions are based primarily on the determination of the amount of periodate reduced and on determinations of the products of oxidation. Glycerin, ethylene glycol, and propylene glycol are among the compounds that react with cold periodate and are of particular interest in the analysis of cosmetics. Their oxidation products include formic acid, formaldehyde, and acetaldehyde.

Semimicro volumetric methods are described here for the determination of these oxidation products and of reduced periodate. These methods incorporate modifications of several published procedures. Calculations are included for the estimation of glycerin, ethylene and propylene glycols, either alone or occurring together.

Methods

Reagents: Potassium periodate—0.02 N. Dissolve 4.6 gm of KIO_4 in about 500 ml of hot water. Dilute to about 900 ml with water, cool to room temperature, and make to 1000 ml. (Filter through sintered glass or asbestos if any filter fibers are present in the KIO_4.)

Potassium arsenite—0.02 N. Dilute 100 ml of U.S.P. 0.1 N $KAsO_2$ to 500 ml with water.

Iodine—0.02 N. Dilute 100 ml of U.S.P. 0.1 N iodine to 500 ml with water.

Sodium hydroxide.—0.02 N. Dilute 100 ml of U.S.P. 0.1 N NaOH to 500 ml with water.

Sodium bisulfite.—5 percent. Dissolve 5 gm of reagent $NaHSO_3$ in 100 ml of water.

Borax-sodium carbonate mixture.—Dissolve 4 gm of $Na_2B_4O_7.10H_2O$ and 5 gm of Na_2CO_3 in 100 ml of water.

Aminoacetic acid.—U.S.P. grade.

Starch indicator.—Mix 0.5 gm of soluble starch with 10 ml of cold water and add 90 ml of boiling water. Heat to boiling for about 5 minutes. Cool before use.

Oxidation With Periodate

Have the sample solution to be tested neutral to methyl red and contain not more than 45 mg of glycerol or its

equivalent. (Excess periodate must be present in the oxidation mixture.) Make preliminary tests on unknown samples to determine proper sample size. Test for periodate by adding $NaHCO_3$ and KI to test portions; if excess is present, iodine will be liberated.

Transfer the neutralized sample to a glass-stoppered 100 ml volumetric flask and add 50 ml of 0.02 *M* KIO_4. Make to 100 ml with water, mix well, and allow to stand about one hour.

Use aliquots of this oxidized mixture in each of the following determinations:

Determination

(1) Formic Acid.—Transfer a 20 ml aliquot of the oxidized mixture to a titration flask. Add a drop of methyl red indicator solution and titrate with the NaOH to a clear yellow. Reserve the solution for determination of excess periodate.

Apply appropriate corrections for any acidity in the 0.02 *M* KIO_4.

1 ml of 0.02 *N* NaOH = 0.92 mg of formic acid
= 1.84 mg of glycerol

(2) Excess periodate.—After the titration with NaOH dilute the solution to about 50 ml with water. Add about 0.5 gm of $NaHCO_3$, 0.2 gm of KI, and 5 ml of the starch indicator. Titrate immediately with the $KAsO_2$ to the disappearance of the blue color. Allow about 5 minutes for the reaction to reach equilibrium and to determine the final end point.

Standardize 10 ml of the KIO_4 by the same titration procedure used with $KAsO_2$. 10 ml of 0.02 *M* KIO_4 = 20 ml of 0.02 *N* $KAsO_2$.

The difference between the two titrations is a measure of the amount of periodate reduced.

1 ml of 0.02 *N* $KAsO_2$ = 2.3 mg. of KIO_4
= 0.46 mg of glycerin
= 0.62 mg of ethylene glycol
= 0.76 mg of propylene glycol

(3) Total Aldehyde (Formaldehyde and Acetaldehyde).—Pipette a 20 ml aliquot of the oxidized mixture into about 5 ml of the $NaHSO_3$ solution. Let stand for 30 minutes at room temperature. Dilute with water to about 50 ml. Add 5 ml of starch indicator, and sufficient strong (about 0.5 *N*) iodine solution to destroy excess sulfite. Discharge the blue color with a drop of the $NaHSO_3$ solution and make a careful adjustment to the starch end point with the iodine solution.

Add 10 ml of the borax-Na_2CO_3 mixture and titrate with the iodine solution to an end point that is stable for one minute or longer. The latter titration is a measure of the sulfite bound as aldehyde complexes, i.e., a measure of total aldehydes present.

1 ml of 0.02 *N* Iodine = 0.30 mg of formaldehyde
(from total aldehyde) = 0.44 mg of acetaldehyde
= 0.31 mg of ethylene glycol
= 0.38 mg of propylene glycol
= 0.46 mg of glycerin

(4) Acetaldehyde.—Assemble a gas absorption train, consisting of four 6x1 inch test tubes fitted with 2-hole rubber stoppers, each stopper carrying one short piece of glass tubing and one long enough to reach to the bottom of the test tube. Connect with rubber tubing so that CO_2 gas under pressure will bubble through any liquid in the first tube and then through the liquids in remaining tubes.

Transfer a 20 ml aliquot of the oxidized mixture of the sample to Tube 1 and add about 2 gm of $NaHCO_3$. In Tube 2 place about 0.2 gm of aminoacetic acid, 1 gm of NaHCO, and 10 ml of water. Place about 1 ml of the $NaHSO_3$ solution and 15 ml of water in each of Tubes 3 and 4.

Attach a CO_2 supply to Tube 1 and force the gas through the train at the rate of about 1½ liters per minute. Continue the aspiration for about 1 hour, then transfer the contents of Tubes 3 and 4 to a titration flask. The volume, including wash water, should be about 50 ml.

Add starch indicator, destroy excess sulfite with strong iodine, and determine aldehyde bisulfite as directed under "Total Aldehydes."

1 ml of 0.02 *N* Iodine = 0.44 mg of acetaldehyde
(from acetaldehyde)
= 0.76 mg of propylene glycol.

Application of Methods

Table 23 shows the relationships that form the basis for calculations on mixtures.

Table 23—Comparative volumes of 0.02 *N* reagents required by individual alcohols.

	0.02 *N* NaOH (Formic Acid)	0.02 *N* Arsenite (Reduced KIO_4)	0.02 *N* Iodine (Total aldehydes)	0.02 *N* Iodine (Acetaldehyde)
Glycerin	1	4	4	0
Ethylene Glycol	0	1	2	0
Propylene Glycol	0	1	2	1

With pure glycerin the formic acid titer in ml of 0.02 *N* sodium hydroxide will be ¼ of the reduced potassium periodate of 0.02 *N* arsenite and also ¼ of the 0.02 *N* iodine titer obtained in the determination of total aldehydes.

In a mixture containing glycerol and ethylene glycol, four times the formic acid titer is subtracted from the volume of 0.02 *N* iodine or from 0.02 *N* arsenite to correct for the effect of glycerin. The balance of iodine or arsenite may then be calculated to ethylene glycol.

Since carbitol of commerce is about 73 percent pure diethylene glycol, monoethylether and the balance if primarily ethylene glycol, then to compute the amount of carbitol present, multiply the percent ethylene glycol found by 4 and a fair approximation will be obtained; for a more exact method see (C-180).

The determination of acetaldehyde is used as the basis for the estimation of propylene glycol. In the presence of glycerin ethylene glycol, and propylene glycol, the glycerin is calculated from the formic acid titration and propylene glycol from the acetaldehyde titration. Ethylene glycol may then be calculated in two ways:

(1) Subtract 4 times the formic acid titer and the acetaldehyde titer from the arsenite titer. The difference multiplied by 0.62 gives mg of ethylene glycol, or (2) subtract 4 times the formic acid titer and 2 times the acetaldehyde titer from the total aldehyde titer. The difference multiplied by 0.31 gives mg of ethylene glycol.

Preliminary investigations have been made on sorbitol syrup and on mono- and diethanolamines that react with periodate. Tests have failed to confirm the literature statement that diethanolamine yields 4 mols of formic acid.

C-179—GLYCERYL AND GLYCOL STEARATES

Because these compounds are used together with other fatty materials it is difficult to effect a separation. Ordinarily, it is best to saponify the total fatty portion. Then determine the amount of fatty acids liberated together with the amount of glycerin (C-176 and 178) or glycol (C-178).

If there is reasonable assurance that no other hydroxylated compounds are present, then the acetyl value may be determined and calculated to the derivative. This covers such trade-named products as Tegin, Tegacid, Tegin P, Diglycol Stearate, Emcol and Bemul.

Figure 126. Northam Warren Laboratory

GLYCERYL BORATES

Responds to test for Borate (C-84-85-86) and to test for Glycerin (C-178-9).

GLYCOL BORATES

Responds to test for Borate (C-84-85-86) and to test for Respective Glycols (C-178-9).

C-180—GLYCOL

Diethylene, Monoethyl Ether, (Carbitol), in Creams (I. S. Shupe, J. Assoc. Off. Agr. Chem. ***24,*** *936, 1941)*

In the presence of sorbitol, propylene glycol, glycerin, triethanolamine, diethylene glycol, acidify a 5 gram portion of the cream with acetic acid, add sufficient benzene to dissolve fats, warm, separate, saving the aqueous portion and make up to exact value. Use an aliquot containing about 100 mg place in a separatory funnel, add an equal weight of potassium hydroxide pellets and extract with a solvent consisting of equal parts of petroleum benzin and ether. The proportion of solvent to carbitol must be about 100 to 1 to prevent formation of a third layer. Combine solvent portions and extract the carbitol with distilled water. Now proceed with the determination of the carbitol.

In emulsified lotions, proceed as above to separate the carbitol from interfering substances.

In clear lotions containing no fats or alcohol add an equal weight of potassium hydroxide and continue, starting with the words "add about 5 ml . . . ."

Method

Reagents

(a) *Potassium hydroxide.*—Reagent grade with minimum of 85 percent KOH.

(b) *Acetone-benzene mixture.*—Equal volumes of acetone and benzene, which are alcohol-free, are mixed.

(c) *Carbon disulfide.*—Reagent grade, alcohol free.

(d) *Petroleum benzin.*—U.S.P., B.P. 35-80° C.

(e) *Potassium iodide.*—Reagent grade.

(f) *Iodine.*—0.05 *N*. Dilute an accurately measured portion of U.S.P. 0.1 *N* iodine solution with water to exactly twice its original volume.

(g) *Starch solution.*—Dissolve 0.5 gm of soluble starch in 100 ml of boiling water.

Quantitative Procedure

Place 10 ml of an aqueous solution containing 25-250 mg of diethyleneglycol monoethyl ether in a separatory funnel. Add 10 grams of solid KOH and cool under a stream of water during solution. Add about 5 ml of the CS_2 and shake for about 1 minute. Permit gases to escape by opening the stopcock cautiously. Shake at intervals for 4 minutes and extract with four 15 ml portions of the acetone-benzene mixture. In making the extractions, draw off the lower alkaline layer into a second separatory funnel, pour the acetone-benzene layer from the top onto a pledget of absorbent cotton (about ¼ gm) placed in an ordinary long-stemmed funnel inserted through the top of a third separatory funnel. Wash the orifice of the first separatory funnel with a little solvent mixture and wash out with the next 15 ml portion of solvent. Drain the solvent into the second separatory funnel, shake thoroughly, and continue as before until the four extractions have been made. Discard the alkaline layer. Wash the cotton and funnel stem with a little solvent mixture and add about 30 ml of the petroleum benzin to the combined filtered extracts. Extract the organic solvent mixture with a minimum of three 25 ml portions of water. Drain the water layers into a titration flask and add enough water to make 200 ml volume. (A drop of phenolphthalein indicator may be added to check the absence of KOH.) Add about 2 gm of the KI and 5 ml of the starch indicator. Titrate with the iodine solution to a blue end point. (Owing to the presence of acetone the end point gradually fades.)

1 ml of 0.05 *N* iodine = 6.7 mg of diethyleneglycol monoethyl ether ($C_6H_{14}O_3$).

Identification

Prepare the xanthate from 200-500 mg of diethyleneglycol monoethyl ether by the method described under the quantitative procedure. Maintain the (1 plus 1) proportion of KOH in the preparation. Make extractions with two 15 ml portions of the acetone-benzene mixture. Filter the extracts through cotton into a beaker. Add 50 ml of the petroleum benzin, stir, and let stand until most of the viscous xanthate has collected on the bottom of the beaker. Pour off the solvents and wash with a little petroleum benzin.

Dissolve the viscous xanthate in about 2 ml of anhydrous amyl alcohol and add 15 ml of the CS_2. Cool in a mixture of ice and salt to about —5° C and add small portions of anhydrous ethyl ether, stirring to induce crystallization. Collect the crystalline xanthate in a sintered glass filter crucible, wash with ethyl ether, and keep covered with a layer of ether to prevent absorption of moisture. Dry the precipitate by aspirating air (previously dried by passage through H_2SO_4) through the crucible. Diethyleneglycol monoethyl potassium xanthate, processed in such a

manner as to crystallize, melts at 86°-88° C.

Transfer an accurately weighed portion of the dried xanthate (about 0.3 gm to a flask, and dissolve in 200 ml of water. Add the starch indicator, and titrate to a blue end point with the iodine.

Calculate the iodine equivalent as follows:

$$\text{I (equiv.)} = \frac{\text{ml of 0.05 } N \text{ iodine x 6.346}}{\text{Wt. of xanthate in grams}}$$

The theoretical iodine equivalent of diethyleneglycol monoethyl potassium xanthate is 511.1.

The molecular weight of the alcohol portion of the xanthate may be calculated as follows:

$$\text{Mol. wt. of alcohol in xanthate} = \left[\left(\frac{\text{mg of xanthate x 20}}{\text{ml of 0.05 } N \text{ iodine}}\right) - 114.2\right]$$

The molecular weight of diethyleneglycol monoethyl ether ($C_6H_{14}O_3$) is 134.1.

C-181—GLYCERIN AND GLYCOLS

(A.A.T.C.C.)

Transfer the water extract to a 50 ml Erlenmeyer flask, add a few crystals of potassium bisulfate and evaporate to dryness. Odor of acetaldehyde when almost dry indicates the presence of ethylene or diethylene glycol. Insert stopper with glass tube, then heat strongly, passing gas evolved into Schiff's reagent in a test tube. Continue heating for 5 to 10 minutes. If glycerin is present, Schiff's reagent will gradually become colored to pink to purple. Heat the test tube in hot water together with a second tube containing the colorless reagent. As the tubes become hot, color will develop in both, the one testing for glycerin should be more purplish. Cool. The blank will become almost colorless: that of the test will become less purplish, but the color will not fade out as in the blank.

Schiff's Reagent

Dissolve one gram of fuchsine in 1000 ml of water. Dilute 150 ml of this solution to 1000 ml and pass in SO_2 until the solution is almost completely decolorized. On standing it becomes colorless. Another method of preparation of this solution is to mix 50 ml of a 1 percent fuchsine solution with 250 ml of water and add 20 ml of a 4° Bé. sodium sulfite solution and 2 ml of concentrated sulfuric acid.

C-182—DETERMINATION OF GLYCERIN, SUGAR AND STARCH

(A.O.C.S.)

(1) Determination of glycerol in the absence of sugar. Solutions required:

Potassium Dichromate, 74.552 gm per liter
Sodium Thiosulfate, 0.1 *N*
Potassium Iodide, 10 percent

Dissolve an accurately weighed sample of the soap equivalent to not more than 3.0 gm of glycerin in 200 cc of hot water in a 600-cc beaker. (If starch is present, it will be necessary to remove the matter insoluble in water as described under this determination (see "Total Matter Insoluble in Alcohol"-1 and 3). Combine the alcohol and water solutions, evaporate off the alcohol, and proceed.) Decompose with 25 cc sulfuric acid (1:4). If alcohol is present, volatilize it by boiling for 20 to 30 minutes. Cool, remove and rinse the cake of fatty acids, transfer the acid water and rinsings to a 500-cc graduated flask, add about 0.25 gm silver sulfate to precipitate traces of chlorides and soluble fatty acids. Make up to volume and mix contents thoroughly.

Transfer a filtered, accurately measured 50-cc aliquot of the above to a 400-cc beaker, to this add 75 cc accurately measured potassium dichromate solution, followed by 25 cc of sulfuric acid (sp. gr. 1.84). Cover with a watch glass, and oxidize by heating to 90° C for 3 hours. Conduct a blank in like manner but using 100 cc of water, 25 cc of sulfuric acid (sp. gr. 1.84), and 25 cc accurately measured potassium dichromate.

Cool and make up the solution to 1000 cc in graduated flasks. The excess of potassium dichromate is determined by taking 50 cc aliquot of the above, adding 50 cc of water, 20 cc of 10 percent potassium iodide solution, and titrating the liberated iodine with 0.1 *N* thiosulfate, using starch solution as indicator.

Calculate the percentage of glycerin (1 cc of the potassium dichromate solution equals 0.0100 gm of glycerin).

(2) *Determination of sugar.* Dissolve 10 gm (±0.01 gm) of the soap in 200 cc of hot water in a 600-cc beaker. Decompose with 25 cc of sulfuric acid (1:4), boil gently for 20 minutes to invert the sugar completely. Cool, remove and rinse the cake of fatty acids. Extract the acid liquid with 25 cc of ether. Transfer the acid liquid to a 500-cc graduated flask, make up to volume and mix thoroughly. Determine invert sugar in 50 cc of this solution by the Munson-Walker Method. To calculate sugar (sucrose) multiply the amount of invert sugar found by 0.95. (Note: If starch is present, this must first be removed as described under "Determination of Glycerin, Sugar, and Starch" (1) and then proceed as above.)

(3) *Determination of glycerin in the presence of sugars.* Proceed as above under (1), taking a sample so that the sum of the glycerin and sugar is not more than 3.0 gm. [Note: If starch is present, this must be first removed as described in "Determination of Glycerin, Sugar, and Starch" (1).] The solution must be boiled in all cases at least 20 minutes to insure complete inversion of sugar. Determine the amount of potassium dichromate solution required to oxidize both the sugar and glycerin. Determine also the sugar by the method given in (2).

Calculate the percentage of glycerin after deducting the amount of potassium dichromate required by the sugar.

1 cc potassium dichromate = 0.0100 gm glycerin
1 cc potassium dichromate = 0.01142 gm invert sugar

(4) *Determination of starch.* Separate the matter insoluble in water as under "Total Matter Soluble in Alcohol" (3), using a sample of soap that will give not more than 3 gm of starch. Transfer the insoluble matter, without drying, to a beaker and heat for 2½ hrs. with 200 cc of water and 20 cc of hydrochloric acid (sp. gr. 1.125) in a flask provided with a reflux condenser. Cool, and nearly neutralize with sodium hydroxide. Complete the volume to 250 cc, filter, and determine the reducing sugars by the gravimetric method as given under method for the determination of sugar.

Calculate the amount of dextrose (d-glucose) equivalent to the cuprous oxide obtained. This multiplied by 0.90 equals the amount of starch.

C-183—GLYCERIN, DETERMINATION IN AQUEOUS SOLUTION

(*O. Juhlin. Z. Anal. Chem.* **113**, *339, 1938*)

A rapid method of determining glycerin is described. A sample containing 0.002 to 0.004 gm of glycerin is weighed into an Erlenmeyer flask, neutralized with 0.1 *N* KOH to which is added 10 cc of 0.1 percent solution bromine water. Stopper, and after standing 15 minutes, 10 cc of 10 percent KI solution is added with 50 to 100 cc water. Liberated iodine is titrated with 0.1 *N* thiosulfate. Percentage glycerin is 9206.4n(a—b)2e, where **a** and **b** mls are the titration results obtained in a blank and sample respectively; **n** is the normality of thiosulfate and **e** is the milligrams of sample used.

C-184—GLYCERIN IN KETTLE SOAP

(*K. E. Johnson & H. W. Ladyn Oil & Soap*, **21**, *141, 1944*)

METHOD

1. Scope:

This method covers a procedure for the evaluation of glycerin retained in kettle soap. It is sufficiently quick and accurate enough so that it can be used as an operating control test.

2. Apparatus:

1—Rough balance accurate to about 0.1 gm
2—250-ml beakers
1—400-ml beaker
1—500-ml volumetric flask
1—1000-ml volumetric flask
1—25-ml automatic pipette
1—10-ml pipette
1—50-ml graduate
8—Rubber stoppered pint bottles
9—Comparator tubes (rubber stoppered, 5¼ in., calibrated mark).

3. Reagents:

Potassium Dichromate Solution. Dissolve 74.564 gm of C. P. potassium dichromate in distilled water and make to 1 liter with more distilled water.

Sulfuric Acid. Pour a volume of C. P. sulfuric acid into an equal volume of distilled water and allow to cool.

Lead Sub Acetate (Powdered). Basic Dry Powder, for sugar analysis by the Horne Method.

C. P. Glycerin. Ninety-five percent Glycerin content, U.S.P. grade of glycerin.

4. Preparation of Standard Color Solutions:

Dilute 100 gm of 100 percent glycerin (105.3 gm of 95 percent glycerin) to 1000 ml. Take 10 ml of this solution A and dilute to 1000 ml. Put 10 cc of this solution B into a 250-cc beaker and add enough water so that the total volume will be at least 100 ml. Add 25 ml of glycerin analysis dichromate solution and 50 ml of 1:1 H_2SO_4. Boil vigorously for two minutes. Cool and dilute to 500 ml. This makes a standard colormetric solution for 0.1 percent glycerin value when a 10-gm sample of Kettle Soap is used on the test. Fill a comparator tube to the mark with the oxidized standard solution.

The table below shows the number of ml's of solution B (0.001 gm glycerin per 1 ml) required to be oxidized to give standard color solutions for comparing the percentage of glycerin when 10-gm samples of material are being tested. Preserve the standard oxidized glycerin color samples in pint bottles with rubber stoppers. Temperature does not change the color of the standards.

Percent Glycerin the Standard Color Represents

0.1	0.3	0.5	0.7	0.9	1:1	1:3	1:5
Ml's of Solution B to be Oxidized							
10	30	50	70	90	110	130	150

Make up a complete set of solutions for the comparator tubes by oxidizing the required ml's of solution B. Fill the tubes to the mark with the respective color standard and store in a test tube rack. Plug the ends with rubber stoppers while not being used for comparisons. When excessive evaporation is observed, discard the old sample and refill the comparator tube with fresh solution from the appropriate pint reserve bottle.

5. Procedure:

Weigh out into a 250-ml beaker 10 gm of the soap to be tested, using a rough balance (+ or — .1 gm). Add about 100 ml of distilled water and boil to dissolve. When thoroughly dissolved add successive portions of powdered lead subacetate and boil until the soap and salt are completely precipitated. A little experience will enable one to tell when the soap and salt are completely precipitated. Usually about 5 gm of dry powder will be sufficient. Boil until the precipitated soap is coagulated and the solution is clear. Decant into a 250-ml beaker and wash out the original beaker once with about 10 ml of hot water. Add 1 to 1 C. P. sulfuric acid until the excess lead is precipitated. This point has been reached when no further precipitate is formed on the addition of more H_2SO_4. Filter into a 400-ml beaker, add 25 ml of dichromate solution, 50 ml of 1:1 sulfuric acid, and boil vigorously for at least two minutes.

Pour into a 500-ml volumetric flask, cool under running tap water, and make up to the mark with distilled water. Mix well, and pour into a 5¼ in. comparator tube, to the mark. Match against standard samples by looking through the length of the solutions at a frosted 75-watt light bulb fastened to a table. Estimate any glycerin colors falling between two standard sample colors.

(*Chapter IV continues in subsequent issue.*)